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Organizational Executive Coaching For Extraordinary Futures



**Real Acquisition
Reform (or
Improvement) Must
Come From Within**
by the Under Secretary of
Defense for Acquisition,
Technology, and Logistics

**Someone Else
I Can Talk To**
The Benefits of
Executive Coaching

**Enhancing the
Science and
Technology Manager
Career Field**

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*Under Secretary of Defense for Acquisition,
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Frank Kendall

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Real Acquisition Reform (or Improvement) Must Come From Within

Frank Kendall

Since I returned to government 6 years ago, I have been working with the acquisition workforce and defense industry to improve defense acquisition performance. There is a lot of evidence that we are moving in the right direction. We have also effectively partnered with Congress on some initiatives, and we are in the midst of a new cycle of congressionally led efforts to improve defense acquisition—as in other cases with the label of “acquisition reform.”

I would like to share some thoughts with you about the limitations of legislative tools, and also explain why I believe that lasting improvements must come from within the Department of Defense (DoD)—from our own efforts. Legislation can make our job easier or harder, but it can’t do this job for us. I recently was asked by Chairman Mac Thornberry to attend a roundtable on acquisition reform with the House Armed Services Committee. This article is based in part on the thoughts I communicated to the committee.

First of all, what it takes to be successful at defense acquisition isn’t all that complicated—to first order at least. It consists of just these four items: (1) set reasonable requirements, (2) put professionals in charge, (3) give them the resources they need, and (4) provide strong incentives for success. Unfortunately, there is a world of nuance and complexity in each of these phrases and words. They also apply to both government and industry organizations, but not always in the same way. The fact is that none of this is easy.

Reasonable requirements are not all that simple to create, professionals don’t exist by chance, resources are subject to budget vagaries and other constraints—including a predisposition toward optimism—and incentives are complicated and often have unintended consequences. The work of making each of these four imperatives real for a given program is not easily accomplished, even with strong hands-on leader-



ship. It is even harder to influence through legislation. I have some sympathy—and even empathy—for the difficulty that the Congress and our oversight committees face when they try to “reform” defense acquisition. Congress has two major challenges as it tries to improve acquisition results. The first is the structure of the defense acquisition enterprise itself. The second is the inherent limitation on the set of tools they have to work with to effect change.

One way to imagine the defense acquisition enterprise is as a layered construct. At the base of this tiered structure are the organizations and people that do the actual work of delivering products and services. These people and organization are almost all defense contractors. (I’m oversimplifying a little here—some services and products are provided within government, but this is an exception.) The next layer consists of the government people who actually supervise the defense contractors. This second layer is also the layer at which requirements—a critical input to the acquisition structure I’m describing—directly impact the work. There is a huge variety of contracted services and product acquisitions, and the government people who plan, issue and administer contracts cover a broad spectrum of roles and professional expertise. These two layers are where the action occurs in terms of delivering products and services. Everything else in the acquisition structure is about making these two layers function as effectively as possible.

Above these layers there are chains of command and direct stakeholders of many types, most but not all of whom are located in the organization (military department or component) acquiring the service or product. Next there is a layer of what we like to call “oversight” within the DoD, some of it in the Office of the Secretary of Defense but also a great deal of it distributed in the military departments and agencies. My own position as Under Secretary is a mix of acquisition chain of command responsibilities and policy or oversight.

Finally, at the top of the whole structure, and furthest from where the work is done, there is the Congress, which has statutory authority over the DoD and the entire Executive Branch and conducts its constitutional oversight role.

In order to achieve its objective of improving acquisition, Congress has to penetrate through all the other layers to get to those where the work is done. This isn’t an easy task. The DoD’s relationship with our contractors is defined primarily by contracts, so one route available to the Congress to improve acquisition is to write laws governing defense contracts. These laws then are turned into regulations in our Defense Federal Acquisition Regulation Supplement (DFARS) by people in the oversight and policy layer and implemented

The tough questions have to do with whether the costs of all these provisions in terms of inefficiency, higher barriers to entry for industry, and taxpayer expense are outweighed by the benefits achieved.

by the management layers that are in more direct contact with defense contractors.

As a practical matter, Congress tends to react to events as they occur by passing additional statutory provisions. Congress also tends to make changes or additions whenever committee leadership, members and staff change. Of course, lobbyists for industry and other interests play a role in this process. The result over time is a frequently changing, but usually increasingly complex compendium of almost 2,000 pages of DFARS regulations governing how the DoD contracts for work. A serious effort at acquisition reform would include a complete review of everything in both the Federal Acquisition Regulations (FAR) and DFARS with the first-order goal of simplification and rationalization and the second-order goal of eliminating as much content as possible.

This task would take a good-sized, knowledgeable team up to a year to complete and it would take at least a year more for review and modification to the resulting product. The DFARS is based on the FAR, of course, so this would need to be a federal government, not just a defense, endeavor. I believe this task is worth undertaking, but no one should expect it to achieve miracles; almost everything in the FAR and DFARS is there for a reason—usually as an expression of policy goals that are considered worthwhile. The tough questions have to do with whether the costs of all these provisions in terms of inefficiency, higher barriers to entry for industry, and taxpayer expense are outweighed by the benefits achieved. We may only be able to eliminate a subset of existing provisions, but what we could do for certain is have a more consistent, coherent and easily applicable body of regulations. Over time, I have no doubt that Congress would continue to add legislation that would take us down the same path of increasing complexity;

a “reset” every decade or so would be necessary, but I still believe the effort would be of value.

In addition to influencing how the DoD contracts with industry, Congress also attempts to improve acquisition by legislating rules that affect the government oversight layers and the people in them. This indirect approach is based on the premise that oversight and supervisory bodies can have a positive or negative impact on acquisition performance and that laws can in turn improve the performance of those layers. The Weapon Systems Acquisition Reform Act (WSARA) was of this nature. It addressed the systems engineering and developmental test and evaluation offices and it created the Performance Assessment and Root Cause Analysis organization (all within the Office of Acquisition, Technology, and Logistics), for example. Congress also has taken some steps to improve professionalism of the government management team by mandating tenure for program managers and selection rates for acquisition corps officers. Many of the steps Congress has taken, like these, have in fact been helpful.

The more indirect approach to improving acquisition by redesigning oversight structures and processes also suffers from the problem that it only impacts what happens in the top layers of the structure—not the layers where the work is done. Many outside observers seem to confuse the efficiency of the defense acquisition system, (i.e., the process by which program plans are approved and program oversight is executed), with the fact of cost and schedule overruns on particular programs. I sometimes make the point that the DoD only has two kinds of acquisition problems—planning and execution. The burden on the military department or component of preparing a plan and getting it approved is an overhead cost we should seek to reduce, but that burden shouldn’t be confused with the failure to deliver a product or service on time and within cost. Where the DoD’s oversight structure falls short is when it approves an unrealistic plan and thereby fails to prevent overruns and schedule slips. The oversight mechanisms succeed when they produce a more affordable and executable plan. I think we are fairly successful in this regard. Execution itself is where we most often have problems—and that is squarely the responsibility of contractors we hire and the government people who supervise them—in the bottom two layers I described. Changing the oversight layer’s structure and processes can improve our planning, but it doesn’t lead to better execution.

In my experience, some of Congress’ efforts to improve acquisition have been problematic in three ways. In order of significance they are: (1) imposing too much rigidity, (2) adding unnecessary complexity and bureaucracy, (3) failing to learn from experience.

A lot of the work we have done over the past several years has been to identify and promulgate best practices, but a point I have made repeatedly is that the DoD conducts such a huge array of contracted work that it is counterproductive to impose a one-size-fits-all solution or way of doing business on everything that we do. Imposing rigid rules and universal practices is counterproductive. Overly proscribing behaviors also has the unintended impact of relieving our professionals of the core responsibility to think critically and creatively about the best solution to the specific problems they face.

One thing the DoD is very good at is creating bureaucracy. New procurement laws lead to the creation of more bureaucracy. Last year we provided Congress with a number of recommendations to remove reporting requirements and bureaucracy in the acquisition milestone decision-making process that our program managers go through. Many of these recommendations were included in the Fiscal Year (FY) 2016 National Defense Authorization Act (NDAA). Unfortunately, while some requirements were removed more were added. As indicated above, the overhead we impose on our managers does not directly impact the cost or schedule to complete a program or deliver a service, but it does have the secondary impact of distracting our managers from their job of getting the most out of our resources, and it does increase overhead costs. Frankly, I think we have enough rules; we need fewer rules—not more.

I’ve also been in this business long enough to have seen multiple cycles of acquisition reform. I tell a story sometimes about the first congressional hearing I ever attended. It was in 1980. I vividly remember someone on the committee holding up a program schedule and ranting about the presence or absence of concurrency between development and production. He was very passionate, but I don’t recall if he was for or against having more concurrency. We’ve been both for and against high degrees of concurrency several times over the years. Concurrency is one of the many judgments best left to professionals who understand the risks in a particular new product design and the urgency of the need. I also spent several years cleaning up the messes left behind in the late 1980s by an early round of self-imposed fixed price development contracting, which at one time was a presumed panacea to overruns in development. It was a disastrous policy that we swore we would never try again.

The sign outside my door, “In God we trust, all others bring data,” isn’t there as a joke. We need to learn from our experience, and the data tell us very clearly that fixed price development is usually, but like everything in acquisition, not always, a bad idea. We should not be making arbitrary acquisition policy changes under the guise of reform just because we are not

fully happy with the results we've seen recently. Doing something different ought to reflect a factual basis for thinking that change will make things better. At the very least, novel ideas should be tried on a small scale in pilot programs before they are mandated more broadly. We need to learn from our experience, and, in general, passing laws that force us to repeat unsuccessful experiments is not wise.

Let me come back to where I started, with a description of what it takes to succeed in acquisition. Requirements drive what we acquire and they are set by our customers—the warfighters and the organizations that use the services or products we procure. Setting reasonable requirements that meet user needs operationally but are still achievable within a specified timeframe, consistent with the need at an affordable cost is a matter of good professional judgment. These judgments can't be legislated. They occur when operators, intelligence experts, acquisition professionals and technologists work together.

Creating complex new defense products that provide technological superiority is a job for true professionals, in industry and government. It is very hard to write a law that makes someone a better engineer or program manager. We have to develop these professionals over their careers in industry or government. Adequate resources are a concern of Congress, but they are authorized and appropriated in the context of the budgets the DoD submits. Historically, our greatest failing in building those budgets has been to be too optimistic about the resources we needed to deliver a product or service successfully, or about what we expected we could afford in the future.

Sound cost estimating, rational affordability constraints and leadership that insists on the use of realistic costs also are hard to legislate. Incentives for acquisition success in government come from the dedication of our workforce members and how they are encouraged and rewarded by the chain of command and their institutions. Again, this is about leadership, not legislative rules. For industry, it is a matter of aligning financial incentives with the government's objectives in a way that successfully improves contractor behaviors. And this requires professional judgment that must be tailored to the individual situation—not something that can be directed in legislation with broad applicability.

The bottom line of all this is that there won't be meaningful acquisition improvement except by our efforts. Congress can make things easier or harder, but this is still our job. We should be encouraged by the fact that we have made a great deal of progress over the last several years. The data support both that we are making progress and that there is still room to improve. As an example, we recently calculated the net Major Defense Acquisition Program overrun penalty for the Services that the FY 2016 NDAA directed. As of today, because of the savings we have achieved, we have built up a "credit" of more than \$25 billion in underruns across the DoD. We also have some programs that have come in above their predicted costs, but the number of programs in which we are beating our original projections for Program Acquisition Unit Cost outnumbers the programs where we are seeing overruns by about 2 to 1. We need to stay on course; keep up the good work. &

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Organizational Executive Coaching

For Extraordinary Futures

Joe Beel ■ Lois Harper ■ Brian Marsh





A theme that frequently emerges during coaching engagements is that the Extraordinary Future is beyond the capacity of its leader acting alone. No one is an island, and it is through those they lead that catalytic actions are achieved.

Building a strong “board of directors” composed of those who can influence attainment of the Extraordinary Future also is an essential ingredient. The members of this “board of directors” should be united to support each other, yet be willing to have difficult conversations rather than yield too quickly just to “get along.” High-performing “boards of directors” express their ideas generously and are free to disagree. It is this construct that acted as the genesis for Defense Acquisition University’s (DAU’s) Organizational Executive Coaching (OEC).

In 2013, two Department of Defense acquisition leaders were interviewed to gain their perspective on outcomes resulting from DAU Executive Coaching for an article published in the September-October 2013 issue of *Defense AT&L* magazine. The participants discussed how Executive Coaching provided a “strategic confidant” that allowed the leaders to candidly discuss and explore the challenges they confronted. The coach helped the leaders formulate the actions to create a navigable pathway for even greater leadership success.

DAU’s executive coaches work one-on-one with these high performers to help them realize an “Extraordinary Future” for themselves and the organizations they lead. For these two leaders, as well as other DAU clients, entering into an executive coaching arrangement gave them just the right impetus to achieve more than they previously thought possible. From the viewpoints of both clients and coaches, this current article addresses how a leadership team transforms their thinking and subsequent actions to achieve an Extraordinary Future.

From One-on-One to Organizational Executive Coaching

For most executive coaching clients, the relationships with their coaches endure well past the end of the formal coaching phase. As an accountability partner and sounding board, a coach can be available for informal progress checks and problem solving. A shift in organizational mission or a change in a client’s previous position can afford another opportunity to evolve a new Extraordinary Future and coaching relationship.

A client also could require an alternative coaching approach that warrants more leadership team cohesiveness to define and implement an Extraordinary Future. The OEC’s particular approach has given DAU

Beel is a strategic programs manager at Cisco Systems, Inc. He retired from the Navy in 2014 and served last as the commanding officer of Space and Naval Warfare Systems Center Pacific. **Harper** is the director of Major Defense Acquisition Programs and Executive Coaching Champion at Defense Acquisition University’s West Region. **Marsh** is the assistant chief engineer for Mission Assurance and Certification at the U.S. Navy’s Space and Naval Warfare Systems Command in San Diego, California. The authors would like to thank Rear Adm. John Ailes, Carmela Keeney, retired Rear Adm. Jim Rodman, and Rob Tremaine for their contributions to this article.

Leaders usually resort to a yearly offsite gathering where strategic planning becomes a “one and done” less valuable proposition. Clearly, addressing critical strategic goals once a year is less than ideal.

the opportunity to extend its Executive Coaching reach into coaching an organization’s leadership team toward a collective Extraordinary Future. “Shared leadership” constructs and even the sheer size of an organization may necessitate an OEC approach. The expectation is that OEC would move outside the normal strategic planning process, capture an extraordinary vision of the future, and align the leadership behind it. Questions about roles, mission, functions and alignment across the enterprise make for an ideal time for organizations to obtain a DAU executive coach.

A key principle of executive coaching is to visualize the possible, in the absence of certainty, and work backward to achieve it. Envisioning what the organization could look like without constraints affords more metacognition (i.e., thinking about thinking) and can lead to a variety of breakthroughs. This is a new way of thinking for many leaders and their teams who may fall into groupthink. This approach reduces or eliminates many of the common barriers to change. The tendency is to reshape the executive coaching process and the development of an Extraordinary Future into what the teams already are working on—primarily a strategic plan. The leadership team needs to change its thinking, and an executive coach will challenge the leaders to accomplish this.

Organizational Coaching Delivers Quality Long-Term Thinking

Widely accepted as an organization imperative, strategic planning serves as an organization’s compass and is tightly aligned with organizational goals, performance targets and reward systems. Strategic Plans function as a touchstone and typically contain standards and benchmarks that guide an organization’s day-to-day operations. Most strategic plans remain static because of the temptation to spend most time on urgent and important (Stephen Covey’s Quadrant I) activities. However, a strategic plan cannot be implemented without concentrating on those things that matter in the long term—matters that are not immediately urgent and important (Quadrant II). Unsurprisingly, setting aside the today’s urgent tasks to spend critical thinking “QII” time is uncommon. While leading a large organization, finding QII time becomes exponentially more difficult. Leaders usually resort to a yearly offsite gathering where strategic planning becomes a “one and done” less valuable proposition. Clearly, addressing critical strategic goals once a year is less than ideal. DAU’s OEC process helps address organizational strategies on a regular and recurring

basis. The team realizes its individual and collective behavior had to change, and the quality of time in the strategic planning process vastly improves.

In addition, coaching also develops the skills of the leadership team. Leaders tend to implement the initiatives of the strategic plan without stepping back and learning from the experience of doing so. Coaching allows the leadership team to continually keep an eye on what is vital to deliver the Extraordinary Future outside the constraints of what they execute, monitor and measure day to day. The team members build off each other’s ideas and approaches in a highly interactive manner. OEC provides a “space to think” vice an “over the fence” sharing of ideas via quick e-mails between meetings or at the end of a long day.

Finally, one question from the coach frequently causes the clients to challenge their own assumptions and those of others. The moments of silence, uneasiness and glances between the team members, generated by the right question, most often leads to new insights. Guided by a coach, it is a fresh look, unencumbered by what others believe matters the most when it may not really matter at all.

Clients value the diversity of the participants OEC provides. While a single leader may have an Extraordinary Future and can be coached on how to convey that future, it’s often difficult to convert this conceptual future into action. Leadership influence and vision of the team is far greater than summing that of the individuals. That greater outcome is achieved by bringing together a diverse set of organizational leaders and

Figure 1. Stephen Covey’s Time Management Quadrants

I	Important and Urgent	III	Important but Not Urgent
II	Urgent but Not Important	IV	Not Urgent and Not Important

asking them to stretch for a set of unifying themes, goals and strategies.

Built Upon Proven Practices

Extending DAU's initial "individual" executive coaching model for leadership teams through OEC proves equally beneficial. These proven process elements include an Extraordinary Future "blueprint," key stakeholder identification and strategies, feedback from those stakeholders, and tools that enhance the leadership team's ability to implement the Extraordinary Future. All of this is accomplished through powerful questioning techniques and by giving the team time to reflect and develop its own solutions.

The coach explores how each individual (attributes, attitudes and behaviors) contributes to and impacts the team. A diverse team also results in a diverse number of stakeholders. The effectiveness of reconciling those who are influenced by and could influence the leadership team's Extraordinary Future allows them to pinpoint those from whom they desire feedback.

To get the most out of DAU's OEC process, the coaching products should become an integral part of the organization's leadership process. The Extraordinary Future blueprint allows the leadership team to break the Extraordinary Future into increasing levels of detailed actions and measures, moving from theory to the real world and transforming what can be overwhelming into doable pieces. Breakthroughs are measurable, tangible objects or events that must be achieved in order to realize the Extraordinary Future. What is missing that would satisfy the Extraordinary Future? Strategies are the plans to follow to achieve each breakthrough. A coach will challenge the team to assess their current reality in terms of attaining the breakthroughs and gain insights to formulate strategies that will frame the actions to achieve each one. Finally, setting 30- to 60-day catalytic actions will get the team moving to achieve success quickly. The coach helps the team move its focus from the entire situation in all its overwhelming complexity and to find a catalytic action that will produce real and significant results now.

Obtaining feedback from stakeholders that are key to the organization's Extraordinary Future requires deviating from the method for an individual client's 360-degree feedback from all parties interacting with and affected by the client.



Rear Adm. John Ailes, Space and Naval Warfare Systems Command (SPAWAR) chief engineer, takes part in an executive coaching session led by the Defense Acquisition University's Executive Coach Lois Harper. From the left are Mark Reinig, chief of staff; Ailes; Harper; Greg Shaffer, assistant chief engineer; Brian Marsh, assistant chief engineer. Mike Spence, SPAWAR's deputy chief engineer, also was involved in the coaching session but was not photographed.

U.S. Navy photo by Rick Naystatt/released

Feedback is obtained through interviews that enable the coach to probe into situations, behaviors and impacts expressed by the interviewee. Behaviors of an organization and/or team are not single faceted, and there is an opportunity to explore organizational culture beyond a single leader.

Gathering feedback across the organization could confirm whether the organization has taken on the culture of its leader or vice versa. Exercising two different interview methodologies accommodates the external (one-on-one interviews) and internal (focus group) stakeholder feedback collection needs. Questions to the external stakeholders center on organizational value and the leadership team's ability to provide this value. For example,

- What do you see as this organization's priorities and how is it meeting them?
- What are the strengths of this leadership team?
- What strengths might turn into liabilities if leveraged too much or incorrectly?

The internal "focus" team questions assess the organization's strengths, gaps and how to look forward. Examples:

- What are the questions leadership should be asking to effectively prepare for the future?
- What does the leadership team do best?
- What should this leadership team stop doing?

The focus group method of collecting internal feedback leads to a healthy, nonattributable dialog across functional,

project, and hierarchical lines. Enlisting the assistance of a DAU executive coach who is independent of your organization will provide more candid feedback than can be obtained from someone within the organization. That advantage becomes clear as your team and coach assess stakeholder feedback. Picking up on themes will help further define breakthroughs that truly matter.

Throughout the entire coaching process, the leadership team uses a variety of tools the coach possesses that assist in identifying and mitigating barriers to attaining the Extraordinary Future. Many of these tools help the leadership team members work better with each other. The coach may also conduct a one-on-one session with team members to explore their individual perspectives, time management methods and organizational makeup to assist with breaking through barriers that may individually hinder achievement of the team's Extraordinary Future.

Making Organizational Executive Coaching Work

To deliver favorable results, it is essential to work with the DAU executive coach and tailor the coaching process that best fits an organization. Some of the factors to consider include: (1) the state of the organization, ranging from one seeking to

improve performance in current missions areas to an organization undergoing radical change to take on new missions/responsibilities; (2) the organizational environment—ranging from supportive to hostile stakeholders; (3) the ability of the organization to accept and implement change; and (4) the individual and collective strengths/weaknesses its organizational leaders.

The DAU coach guides you through the process to deliver the results you codify on your Extraordinary Future Blueprint. The coaching process creates increased loyalty and deeper trust between individual team members. Better understanding and synchronization of thoughts develop, as well as a personal attachment to create synergy around the Extraordinary Future. Leaders who committed themselves to the coaching process at the OEC level map and find their way to their Extraordinary Future.

Make OEC work for your leadership team, too. Think about your future differently like never before and enlist an experienced DAU Executive Coach to transform your organization, your leadership team and yourself. &

The authors can be contacted at jbeel@cisco.com, lois.harper@dau.mil and brian.marsh@navy.mil.



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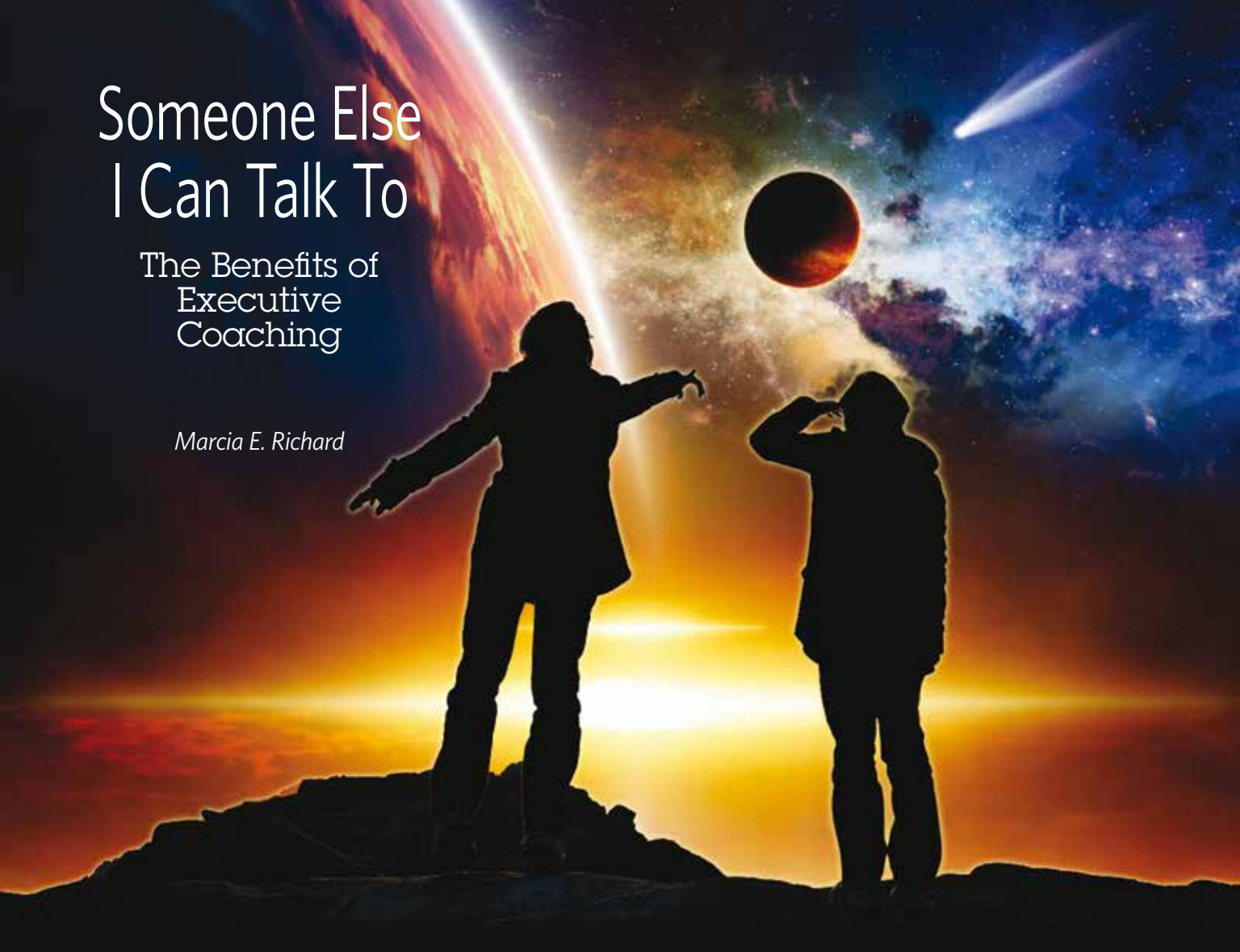


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Someone Else I Can Talk To

The Benefits of Executive Coaching

Marcia E. Richard



Executive and leadership coaching currently is a growing business worth \$2 billion a year. Chief executive officers and senior executives increasingly solicit the assistance of executive coaches. This naturally leads to two follow-up questions: Why are so many people in leadership positions turning to executive coaches for assistance? And how does executive coaching benefit the client and his or her organization?

At a time when the Department of Defense (DoD) is required to do more with less, and senior leaders are asked to come up with new and improved ways to do things (see *Implementation Directive for Better Buying Power 3.0—Achieving Dominant Capabilities through Technical Excellence and Innovation*, April 9, 2015), executive coaching helps smart people clarify their thinking. Dr. Marshall Goldsmith, a world-renowned author and coach, in his best-selling book, “What Got You Here Won’t Get You There,” demonstrates through practice and research how “executive coaching helps successful people become more successful.”

The Defense Acquisition University (DAU) launched its executive coaching (EC) program in Fiscal Year 2009. Its customers are DoD Acquisition, Technology, and Logistics (AT&L) personnel such as general/flag officers and O-6s and their civilian counterparts, members of the Senior Executive Service (SES) and GS-15s, whose responsibilities and decisions affect acquisition outcomes. By design, the DAU EC program provides support for senior

Richard is a professor of Acquisition and Contract Management and an Executive Coach at the Defense Acquisition University. She has more than three decades of acquisition, acquisition-related and executive coaching experience.

leaders who are recognized for making significant positive impacts in their current positions. They also have the vision and drive to go beyond where they are and to do more. The DAU EC program, usually 9 to 12 months in duration, follows a six-step coaching model developed by the Cambridge Group Worldwide, Inc. (See Figure 1.)

During this process, often referred to as a Journey, a coaching relationship is established between the coach and client—a relationship based on trust, confidentiality, mutual respect and accountability. A commitment letter, listing expectations for both the client and coach, is agreed upon and signed by both client and coach (Step 1). At the beginning of the journey, the client identifies and develops an Extraordinary Future that becomes the foundation and the ultimate objective of what the client plans to accomplish at the completion of his or her journey or at a specified time in the future. This often is done after completion of the actual coaching engagement (Step 2).

The Extraordinary Future usually is a vision outside the normal trajectory of what the client would obtain if she simply continued to follow the current path and maintained the status quo. In the DAU EC certification training program, one of the tools is *The Washington Post* exercise, which provides an excellent way to help a client focus on what she would like to accomplish for herself and her organization if, for example, she did not face her perceived constraints. Under the assumptions in this exercise, in 12 to 18 months, readers pick up *The Washington Post* and find an article about the client's organization on the front page, above the fold—because against all odds, the organization had accomplished certain goals that the client had set for herself. According to Cindy Readal, director of acquisition for the Naval Engineering and Facilities Command and a current participant in the DAU EC program, "I must admit as a new SES I went into coaching as a complete sponge to the thoughts (concepts) of guidance of a coach. My expectations were exceeded, as my coach was able to help me take a lot of different ideas and bring those into focus and ensure I had the right level of effort for an actionable plan. Continuing the sessions is enjoyable and ensures I stay on track to achieve my goals."

Charting stakeholders (Step 3) allows the client to think about individuals who influence and may impact the accomplishment of the Extraordinary Future. This step requires the client to develop a strategy for working with stakeholders so they will more likely become champions for the Extraordinary Future—or at least neutralize unsupportive stakeholders so that they will cause no harm. As a part of this step, the client must decide how best and how often she will need to communicate with her stakeholders. In the acquisition workforce, no one works in isolation, and it is necessary to build relationships and solicit support in order to get things done. As we are forced to work with fewer dollars and must master the art of effectively sharing and leveraging resources, it becomes more essential that we identify and collaborate with both internal and external stakeholders.

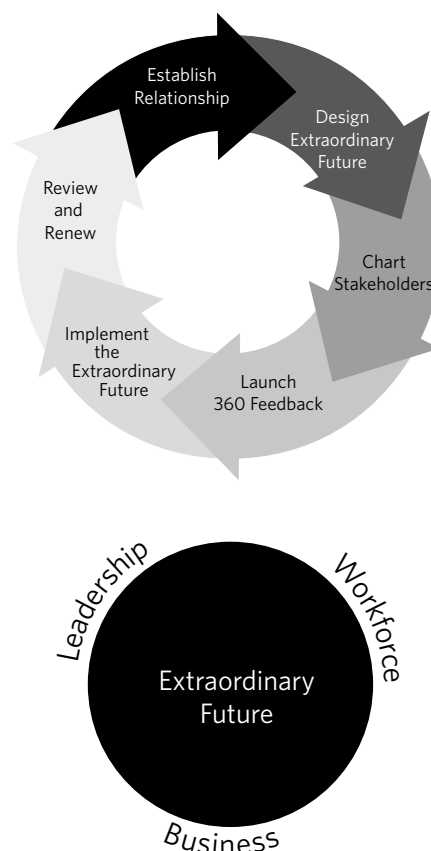
Figure 1. The Coaching Process and Focus

Extraordinary coaching relationships happen by design and effort.

- Monthly face-to-face meetings, biweekly phone calls, 6 to 9 months

The Leader's 100 Percent: Design and implement an Extraordinary Future

The Coach's 100 Percent: Thinking/Being Partner, Sounding Board, Nudge Manager



Top Four Improvements:

- Strategic communication
- Change implementation
- Stakeholder relationships
- Leadership/people interactions

Top Four Business Results:

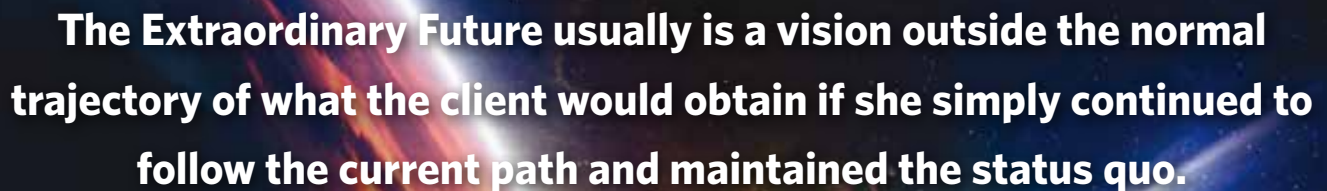
- Increased self/group capability
- Increased customer satisfaction
- Increased resources
- Reduced cycle time

Extraordinary leaders develop the process of producing extraordinary results

Based on Step Coach Model as modified for Defense Acquisition University by Cambridge Group Worldwide.

Based on the stakeholders identified by the client, as well as anyone else identified as influencing the client's success, the EC will conduct executive interviews (Step 4), similar to 360-Degree performance evaluations that take into account the assessments of all parties interacting with the person being evaluated. But the EC executive interviews will be done by conversing either in person or via telephone if a face-to-face meeting isn't feasible rather than by canvassing via an electronic or e-mail survey. Information will be gathered about the client from the perspectives of superiors, peers and subordinates. To be most effective, providing client feedback from executive interviews will be the one time during the coaching journey that the coach is not the client's advocate

After completing an 11-month executive coaching engagement, I asked Rick O'Neil, director of acquisition at the Office of Naval Research, "What was the greatest benefit he received during his Executive Coaching experience? Why?" Rick said, "My coach served as a fantastic sounding board, which afforded me the opportunity to freely explore a number of management challenges and corresponding options within a confidential environment. Having an experienced confidant to help you think through a number of delicate and complex issues before taking action is invaluable to an executive's development. These days, we operate in a highly politicized and often unforgiving environment. Senior executives have to get it right the first time or risk losing precious



The Extraordinary Future usually is a vision outside the normal trajectory of what the client would obtain if she simply continued to follow the current path and maintained the status quo.


and must instead act as a "messenger" to ensure that the client receives unfiltered information from the participants, including any identifiable trends. This feedback is intended to provide the client with honest information on how she is viewed by others—from multiple levels and perspectives in his or her work environment. Once internalized, it is up to the client to determine if corrective action or a change in behavior is warranted.

The implementation step (Step 5) is where the rubber meets the road. During this phase, the Senior Leader deploys specific actions to achieve the defined future outcomes—the Extraordinary Future. While growth and development, as a result of seeing issues and challenges from different perspectives, will occur throughout the entire coaching process, the actual completion of the Extraordinary Future—i.e., achieving results—often may not be realized immediately but may occur well beyond the coaching journey.

In all processes, and this includes executive coaching, we must pause to check out how we are doing and to recalibrate our efforts if we find that is required. At the beginning of each coaching session, the coach normally will inquire how the client is doing and allow him or her to reflect on where they are as it relates to moving toward the Extraordinary Future and to decide on any additional or alternate actions. This also is done in a more defined and strategic fashion at the end of the coaching journey. Client reflection is built into the coaching process to ensure that "busy" senior leaders take the time, in a safe environment, to review and renew (Step 6) their actions and inactions and determine how to move forward as planned and/or how to make the necessary changes to achieve their Extraordinary Future.

credibility. I was extremely fortunate to have a great coach that helped me get it right."

DoD AT&L senior leaders do not have to talk to themselves regarding their vision and ideas. The DAU EC program offers them trained and experienced thinking partners to take an intense and meaningful journey with them. Using active listening, the EC helps to generate thought-provoking and very often difficult questions that should be answered. The EC helps the senior leader to think bigger and broader, aiming for an Extraordinary Future as opposed to a predictable business-as-usual approach. This process can result in more thoughtful, challenging and innovative outcomes for the AT&L community and the DoD as a whole. After the completion of the EC engagement, coaches usually will offer their clients the opportunity to reach out to them on an "as required basis." Often, this is done just to bounce an idea off of someone they trust and get an outside opinion prior to moving forward. In other words, the coach does not have to vanish at the end of the engagement.

As a DAU EC, I personally have witnessed the growth and sense of freedom my clients developed as they have moved through the program. Once they fully understood that coaching sessions are like incubation sessions and that they could speak freely to their thinking partners, who are listening, they grew exponentially in terms of ideas and self-assurance about obtaining an Extraordinary Future rather than a predictable one. I am honored to be a part of this dynamic program that is helping our DoD AT&L senior leaders move from good to great! 

The author can be contacted at marcia.richard@dau.mil.

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Enhancing the **Science and Technology Manager** Career Field

Darren Rhyne

The Science and Technology Manager (STM) career field has come into its own in recent years. This fiscal year alone, two of the three required STM courses are new—and one of them is now the first-ever distance learning (DL) course in the field. A Jan. 2, 2013, memo from Assistant Secretary of Defense for Acquisition Katharina McFarland renamed the “Systems Planning, Research, Development and Engineering (SPRDE) Science and Technology Manager” career field as the “Science and Technology Manager” career field. And other major changes have occurred in the STM career field since an article by Dr. Marty Falk and Randy

Rhyne is a professor of Engineering and Science and Technology Manager (STM) in the Capital and Northeast Region of Defense Acquisition University at Fort Belvoir, Virginia. He is the course manager for the new STM 101 distance learning course and is the Engineering and Technology Department's Engineering and STM Functional Lead.

A team prepares a presentation as part of an exercise.

Photos by Erica Kobren, Defense Acquisition University



Zittel was published in the May-June 2009 edition of *Defense AT&L* magazine (see "Revamping theScience and Technology Management Career

Field" at <http://www.dau.mil/publications/DefenseATL/DATLArchivecompletepdf/may-jun09.pdf>, pp. 64-67). There also have been changes in the Defense Acquisition Workforce Improvement Act (DAWIA) STM certification requirements—including curriculum revisions and knowledge sharing (now known as Workflow Learning) assets. In addition, a set of Acquisition Workforce Qualification Initiative (AWQI) standards focused on STM has been published for the workforce to continue its development beyond DAWIA certification.

STM DAWIA Certification Requirements

Like other DAWIA career fields, the STM career field has three certification levels, each composed of education, experience and training requirements. The criteria for attaining each certification level are managed by the STM Functional Integrated Product Team (FIPT), chaired by the Principal Director, Research Directorate, Office of the Assistant Secretary of Defense for Research and Engineering. However, each Component's Defense Acquisition Career Manager (DACM) actually determines if the workforce member has met the criteria for certification. These certification criteria can be found on the Defense Acquisition University (DAU) iCatalog (<http://icatalog.dau.mil/>) page under the "Certification Standards" button. The education requirements are the same for all three DAWIA STM certification levels. The workforce member must have a "baccalaureate or graduate degree in a technical or scientific field such as, but not limited to, engineering, physics, chemistry, biology, psychology, mathematics, operations research, engineering management, or computer science."

Each STM certification level also requires a certain amount of "technical experience related to science and technology management." The amount of experience is 1, 2 and 4 years, respectively, for Levels I, II and III. Each DACM determines if the applicant's experience is sufficient for the certification level.

The largest change in DAWIA STM certification in recent years is in the training requirements, with two of the three required STM courses new for Fiscal Year (FY) 2016. The new Level I course is the STM career field's first-ever DL course known as STM 101, Introduction to Science and Technology Management. This 4-hour course replaces continuous learning module CLE 045 of the same name. According to its course description, STM 101 "is an introduction to the various technology management processes involved with developing and transitioning new technologies. It provides an overview of the role of science and technology in the systems acquisition life cycle. The course focuses on the processes, techniques, policies and best practices that will be employed to ensure we are investing in appropriate technologies and that those technologies are refined and matured to be ready for use in a timely fashion to provide our warfighters with the technological edge needed to accomplish their mission."

The other new STM course, STM 304 (Leadership in Science and Technology Management), is required for Level III. This 3.5-day classroom course replaces STM 303, Advanced Science and Technology Management. Its development was led by a tenured professor from Georgetown University under contract through the Systems Engineering Research Center. The course description states, "Designed for senior DoD [Department of Defense] science and technology managers, STM 304 focuses on the application of leadership skills within DoD science and technology organizations. It emphasizes the principles of strategic planning, technology roadmap development and technology portfolio development prioritization and evaluation. The course challenges students to think critically in instructor-facilitated exercises to make sound recommendations on which technologies to pursue consistent with organizational core functions, customer requirements and technology opportunities."



Left: A Technology Development Strategy (TDS) briefing. Center: A Technology Transition Agreement briefing. Right: TDS is briefed by another team.

One exercise asks teams to, within a given scenario, create a technology development roadmap. There are two other exercises in which the teams, given a portfolio of technology projects, must evaluate and prioritize them based on a set of objectives. In the capstone exercise, the teams are given three large technology portfolios for which they must develop a strategy for evaluating the projects in each portfolio and then recommend which projects to continue funding, given an overall 20 percent reduction in funding.

The Level II STM classroom course also underwent a make-over that was more cosmetic than a revision. The STM 303 course was made the Level II course and renamed STM 203, Intermediate Science and Technology Management. It replaced STM 202 of the same name but is 3.5 days long, 1 day longer than STM 202. The course's three threaded exercises remain intact. Student teams take a series of technology development projects through project initiation, project execution and project transition. Teams select among competing projects with the goal of transitioning technologies to a program of record. The fourth exercise now has students conduct a mock conference panel based on technology challenges they wrote about in their pre-course papers. The course "provides Science and Technology professionals with an understanding of the procedures and mechanisms that can be used to develop and transition new technologies into the DoD's warfighting systems. It provides students with the opportunity to apply critical skills in areas such as technology evaluation, budgeting, schedule management, contracting strategies, transition agreements, risk/opportunity management, intellectual property, and technology verification."

In addition to changes for the three primary STM training courses, two new required continuous learning modules

(CLMs) have been added to the two existing required CLMs, CLE 021

(Technology Readiness Assessments, for Level II) and CLM 014 (IPT Management and Leadership, for Level III). CLE 068 (Intellectual Property and Data Rights) is a 5-hour CLM required for STM Level I since FY 2013. "This module provides fundamental information about intellectual property and the effective management of rights in technical data and computer software and their contribution to programmatic success. The module addresses concepts and legal guidance related to intellectual property, focusing on the rights in technical data and computer software that are the concerns of the Government and of our defense contractors." The other new CLM, CLE 069 (Technology Transfer), takes about 3.5 hours to complete and was required for Level III, starting in FY 2015. "This continuous learning module enables students to apply the principles of technology transfer to the technologies they are developing with the end goal of increasing the rate of technology transfer."

Besides the STM-focused training, workforce members are still required to take a few courses in other functional areas to become STM-certified. For Level I, members must complete the 25-hour DL course ACQ 101 (Fundamentals of Systems Acquisition Management) and the 35-hour DL course ENG 101 (Fundamentals of Systems Engineering). For Level II, members must complete the 35-hour DL course ACQ 202 (Intermediate Systems Acquisition, Part A). STM Level III contains Unique Position Training Standards for Science and Technology Managers with primary management responsibilities for Budget Activity (BA) 3 projects such as, but not limited to, Advanced Technology Demonstrations, Joint Capability Technology Demonstrations, and Future Naval Capabilities Programs. People in these types of positions may be required to take up to four other Program Management courses and up to four other CLMs identified in the STM Level III career field certification standards.

The STM FIPT also has developed a list of courses to supplement required DAWIA STM training. These CLM, DL, and/or classroom courses are listed under the Core Plus Development Guide section of each certification level. Some of these courses are closely related to the STM and Engineering functional areas while others are from functional areas in which a Science and Technology Manager may most closely interact, such as Program Management, Test and Evaluation, and Business, Cost Estimating, and Financial Management. The workforce member and his or her supervisor should consider these Core Plus courses when preparing the member's annual Individual Development Plan (IDP).


STM Workflow Learning Assets

To support STM workforce members outside the training environment, DAU has developed some Web-based Workflow Learning assets. These include the STM Functional Gateway, managed by the DAU STM Foundational Learning Director, the STM Community of Practice (CoP) on DAU's Acquisition Community Connection (ACC) site, and several STM-related articles on the DAU ACQuipedia site.

The STM Functional Gateway (<https://dap.dau.mil/career/stm/Pages/Default.aspx>) is where workforce members can access more than just DAWIA certification requirements and course descriptions. They also can ask a professor a question that will be routed to a DAU STM faculty member. The professor has 72 business hours to post a response. The STM

methodologies section contains information about various types of business arrangements that the STM profession may use to conduct research with other government agencies, universities and industry, including contracts, grants, cooperative agreements, other transaction authorities, and technology investment agreements. A Science and Technology Manager recommended reading list and some STM-related reports can be found in the publications section of the site. Another section called "Articles & Other Items of Interest" includes articles and presentations that provide a wealth of knowledge from STM professionals across the community. The site also has a section with links to sites about various technology transition and technology transfer programs within the DoD. There also is a section for best practices, lessons learned and tools that STM professionals should find handy. Finally, there is a section containing links to the various DoD agencies that conduct scientific research and technology development, a section on STM-related training, and a "Q&A" forum that allows individuals to ask questions and receive replies from DAU faculty or other workforce members.

Someone who wants to participate in the STM CoP by contributing articles, presentations or other information first needs to register his or her Common Access Card to obtain an ACC account. This is done via the "Request an Account" link in the top left of the ACC home page (<https://acc.dau.mil/CommunityBrowser.aspx>). After obtaining an ACC account, the individual can then register to become a member of the STM



Membership not only allows an individual to contribute to the CoP but also keeps the member informed of changes to the CoP via links e-mailed to the member when something is added to or moved within it.

Functional Gateway also contains a link to the DAU Mission Assistance page that provides information about requesting acquisition workshops, consulting services, team training, and one-on-one leadership development for program executive officers and program managers. On the right side of the STM Functional Gateway are links to STM-related policies, regulations, guidance and law, plus the ACC STM CoP and STM-related ACQuipedia articles.

The ACC STM CoP (<https://acc.dau.mil/CommunityBrowser.aspx?id=17988&lang=en-US>) contains a vast array of information for STM professionals. There are links to DoD and Service-level directives, instructions and guidance. The contracting

CoP by logging into the ACC site, selecting the STM CoP, then selecting that page's "Become a Member" link in the top left corner. Membership not only allows an individual to contribute to the CoP but also keeps the member informed of changes to the CoP via links e-mailed to the member when something is added to or moved within it.

In addition to the STM CoP Workflow Learning asset, there are several STM-related articles posted on the *DAU ACQuipedia* site (<https://dap.dau.mil/acquipedia/Pages/Default.aspx>). This site, which mimics the popular *Wikipedia*, includes more than 350 articles about various acquisition topics that annually are certified as current. Two *ACQuipedia* articles of particular

relation to STM professionals are “Technology Readiness Assessment (TRA)” and “Independent Research and Development (IR&D).” The TRA article was created in 2005 but has been updated numerous times over the years, including the

book accessed from the eWorkbook menu at the top of the page. An *AWQI eWorkbook User Guide*, also available at the site, explains how to use it. The STM competencies, competency elements, outcomes (products) and



STM professionals now have a much better set of training, Workflow Learning assets, and career-enhancing qualification guidance than was available when the 2009 DAT&L article was published.

TRA Guidance published in 2011 and requirement to discuss technology maturity in section 10 of the Capability Development Document from the 2015 *Joint Capabilities Integration and Development System Manual*. The IR&D article was created in 2013 in response to changes in industry IR&D reporting requirements that went into effect in January 2012. Besides describing what IR&D is and the industry reporting requirements, the article provides a link to the Defense Innovation Marketplace site that serves as the one-stop shop for both industry and DoD IR&D-related matters. Users can recommend changes to each of the articles by clicking the “Suggest Change” link by each article section heading. If there is a topic of interest that is not covered in the ACQuipedia, users can request that an article be written by selecting the “Suggest an ACQuipedia Article” button in the bottom left of the ACQuipedia home page.

AWQI STM Qualification Guide

Under the auspices of the Assistant Secretary of Defense for Acquisition and in support of Better Buying Power, selected members of the DAU faculty in 2013 began working with subject-matter experts in the acquisition community to develop qualification standards for workforce members in all acquisition career fields under the Acquisition Workforce Qualification Initiative (AWQI). These qualification standards trace to the acquisition competencies established by the acquisition functional leaders. Each functional area’s competencies, including those for the STM career field, were translated into measurable on-the-job products (also called outcomes) and the corresponding tasks (referred to as standards) that were required to produce those outcomes. In 2015, these competencies, outcomes and standards were compiled into a tool called the *AWQI eWorkbook*.

Qualification standards for the STM career field can be obtained from the AWQI site (www.dau.mil/awqi) by downloading the Microsoft Excel-based *AWQI eWork-*

tasks (qualification standards) are located under the STM worksheet tab at the bottom of the eWorkbook Excel file. There are seven STM competencies divided into 52 competency elements with 68 total outcomes. The seven STM competency focus areas are: core communications skills, audience-focused communications, technical contributions, scientific and technical contributions, strategic planning, portfolio development and technology program management. STM workforce members should use these standards to enhance their professional development by incorporating related training and developmental opportunities into their annual Individual Development Plans.

The AWQI standards provide a structured way for STM professionals to continue to grow, improve acquisition outcomes and help prepare them for lateral or higher positions after obtaining their DAWIA certification level required for their coded position. Science and technology organizations also can use the standards to mitigate skill gaps by leveraging developmental opportunities or targeting strategic hiring, according to the AWQI site.

Conclusion

As described in this article, STM professionals now have a much better set of training, Workflow Learning assets, and career-enhancing qualification guidance than was available when the 2009 *DAT&L* article was published. Members of the STM career field are encouraged to take advantage of these assets to better themselves sooner rather than later, as 18 percent of the 3,600-strong career field is eligible to retire as of FY 2015, 20 percent within 5 years, and 33 percent within 10 years. Learn all you can from the veterans (get a mentor if you can), get your required DAWIA training, participate in the ACC STM CoP, and use the AWQI STM qualification standards to guide your career growth. &

The author can be contacted at darren.rhyn@dau.mil.

STEM Education and Outreach

Strengthening Science, Technology,
Engineering and Mathematics

Tyrone Theriot



The Better Buying Power 3.0 initiatives identified by Under Secretary of Defense for Acquisition, Technology, and Logistics Frank Kendall in April 2015 outlined numerous items, with the common major focus of Department of Defense (DoD) support for Science, Technology, Engineering and Mathematics (STEM) education and outreach.

The Defense Acquisition University (DAU) is known as a corporate university with its mission of training the DoD acquisition workforce. In addition, DAU conducts STEM outreach at high schools in the Fort Belvoir, Virginia, area near DAU's headquarters. Since the fall of 2010, DAU has been offering the STEM Engineering Management Workshop (EMW). The challenge has been to coordinate efforts with school districts in order to find opportunities to engage high-school students throughout the academic school year and over the summer, along with expanding the STEM outreach opportunities from kindergarten through the 12th grade while developing professional development opportunities for educators.

The EMW is one of the principal STEM events conducted by DAU and was derived from the DoD EMW workshop (Workshop Engineering, WSE-006 in the *DAU iCatalog*). The EMW initially was developed as a mission assistance targeted training class in support of the Defense Contract Management Agency (DCMA). A number of adaptations have been incorporated into the EMW in order to meet the needs of various DoD organizations. In the EMW, DoD employees experience an accelerated version of a typical DoD system acquisition. Throughout the 1-week course, participants are actively involved in the designing, building, coding and testing of a robotic vehicle that must meet

Theriot, a retired U.S. Marine Corps lieutenant colonel, is a professor of Engineering, Test and Evaluation and Production, Quality and Manufacturing at the Defense Acquisition University (DAU) at Fort Belvoir, Virginia. The program conducted by the DAU is not affiliated, sponsored or endorsed by LEGO Education or the LEGO Group.

The three-wheeled robotic vehicle shown here and the four-wheeled vehicle on the next page, are the kind of robotic vehicles built and tested in the Engineering Management Workshop. Items in the background, such as the computer mouse, provide an idea of vehicles' size.

Photos by the author



specific cost and performance requirements. The students use a Lego Mindstorms EV3 Education kit to create their hardware design/vehicle and use the Lego Mindstorms software language and modeling environment to develop software coding for programming the vehicle to perform specific functions. This workshop simulates the processes and situations DoD employees face on the job, where they are required to design, build, code and test systems that meet specific requirements while preparing for and conducting technical reviews along the way. Throughout the workshop, participants are introduced to and practice various engineering management skills and competencies such as:

- Systems engineering
- Project management
- Engineering management and design
- Software development
- Risk management
- Technical reviews and audits
- Configuration management

The final day culminates with the teams demonstrating the performance of their vehicle designs during a number of test events, including trial runs around a complex obstacle course. The workshop concludes with a source selection, in which team designs are evaluated based on cost, schedule and performance. One team is declared the winner, based on a best-value trade-off determination.

The STEM EMW is a version of the EMW that is tailored to fit high-school students through the removal of DoD specific acquisition topics. In the STEM EMW, high-school students face many of the same technical challenges and time constraints. The aspects that most challenge the high-school students are critical thinking, team-based project completion and the overall competition as a best value trade-off winner. The high-school students must quickly come together to form a cohesive team to tackle the challenges of the workshop. They must apply critical thinking to many of the issues that arise throughout the workshop, such as developing a

hardware design robust enough to meet the requirements, testing on the track to validate results, or redesigning to meet the requirements. Team members also face individual tasks and must communicate their ideas with the other team members in order to refine the hardware and/or the software along with scheduling the time to test the robotic vehicle.

The STEM EMW is conducted in two different formats to provide an opportunity for students to attend during the school year and the summer vacation. During the school year, the STEM EMW is part of a high-school engineering design class, and students participate in a 3-week delivery of the workshop. Over the summer, students are invited to participate in the STEM EMW during a 1-week workshop that runs all day for 5 consecutive days. Regardless of the format, DAU provides the Lego Mindstorms EV3 Education kits along with a travel laptop for each team as well as the relevant software language and modeling environment. The STEM EMWs are conducted free of cost to the high schools.

The school year STEM EMW is conducted during a regularly scheduled engineering design class that meets 5 days a week in 90-minute sessions. During Week 1, DAU instructors conduct the STEM EMW at the local high school through short lectures, student exercises and hands-on practical applications. These include deliverables such as creating a company name, identifying positions, creating a schedule along with tasks, identifying risks, creating and evaluating hardware designs and preparing for and conducting a technical review. During Week 2, the high-school engineering design instructor assists the students in creating a design using existing CAD/CAM software within the classroom. During Week 3, DAU instructors return to the classroom to deliver short lectures, student exercises and hands-on practical applications.

The students begin creating and testing hardware designs along with developing and coding software using the Lego Mindstorms software language and modeling environment to provide the necessary functionality for test-track operation and testing of the vehicle. The students also conduct a



The culminating event is a demonstration of their vehicles on a test track with one team announced as the overall winner on a best-value basis.

technical review, providing finalized information regarding their project that includes scheduling, risks, testing results, software development packages and enhancements, assembly procedures and training results. The culminating event is a demonstration of their vehicles on a test track with one team announced as the overall winner on a best-value basis.

The summer STEM EMW is conducted over 1 week, meeting for the entire school day over 5 consecutive days. DAU instructors conduct the STEM EMW at the local high school through short lectures, student exercises and hands-on applications. These include deliverables such as creating a company name, identifying positions, creating a schedule along with tasks, identifying risks, creating and evaluating hardware designs and preparing for and conducting a technical review over the span of the first 2 days. DAU recognizes the need to train educators in middle school and high school to provide STEM courses along with creating a menu of STEM events and activities. This is a tentative effort under development at DAU. The challenges in this area are the lack of enough teachers with the necessary STEM backgrounds or STEM professional development. Time is required to research ideas, procure materials necessary for the event and to develop curriculum in support of STEM events.


DAU is developing a train-the-trainer STEM educator course called the STEM Problem-Based Enhanced Educator Development (SPEED). The request to create the SPEED workshop came through a STEM outreach effort at DAU's South Region in Huntsville, Alabama. This workshop provides STEM Educator Professional Development from the 7th through 12th grade level that includes STEM Team Problem-based curriculum planning and development. The pilot course for the SPEED workshop was set for the second quarter of Fiscal Year 2016 at DAU South with an additional offering planned during the summer of 2016, with no attendance costs to the STEM educators or the school districts.

DAU also is working with Missile Defense Agency Headquarters at Fort Belvoir, Virginia, to tentatively begin efforts to research and develop STEM courses for educators across

all primary and secondary school grade levels (1st through 12th grades). While the STEM EMW is one 5-day course designed for the high-school level, other organizations across the DoD conduct STEM events of various lengths designed for the elementary-, middle- and high-school levels. The U.S. Naval Academy conducts short-duration STEM events over a few hours that can be expanded as required, and the topics covered include Energy, Cyber, Mechanical Engineering and Engineering Design for the middle-school level.

Collecting best practices and developing STEM short courses along with creating the curriculum, identifying materials and classroom requirements will enable STEM educators across the country to pick and choose topics of interest and also will enable them to quickly insert and deliver STEM courses and incorporate them into their classrooms.

Each of the five DAU regions—Capital Northeast (CNE) at Fort Belvoir, Virginia, Mid-Atlantic at California, Maryland, Midwest at Kettering, Ohio, South at Huntsville, Alabama, and West at San Diego, California—conducts various forms of STEM outreach within their local communities. The impact of the relationship CNE has fostered between Fauquier County Public Schools (FCPS) in Virginia has increased demand and interest in STEM courses within the FCPS. The STEM outreach efforts are not limited to the FCPS. CNE continues to establish and develop relationships with other school districts. As a result, CNE has received multiple inquiries and requests for STEM EMWs at Quantico high school (DoD school on the Marine Corps Base at Quantico, Virginia) along with Stafford County and Spotsylvania County, Virginia, public school districts. All of this STEM outreach can be traced back to the Better Buying Power 3.0 initiatives with the only limitation now being travel expenses to conduct STEM outreach beyond the local DAU regions.

For more information about DAU's STEM outreach within CNE, please contact the author at the e-mail address below. 

The author can be contacted at tyrone.theriot@dau.mil.

Critical Thinking

An Overview of the Defense Acquisition System

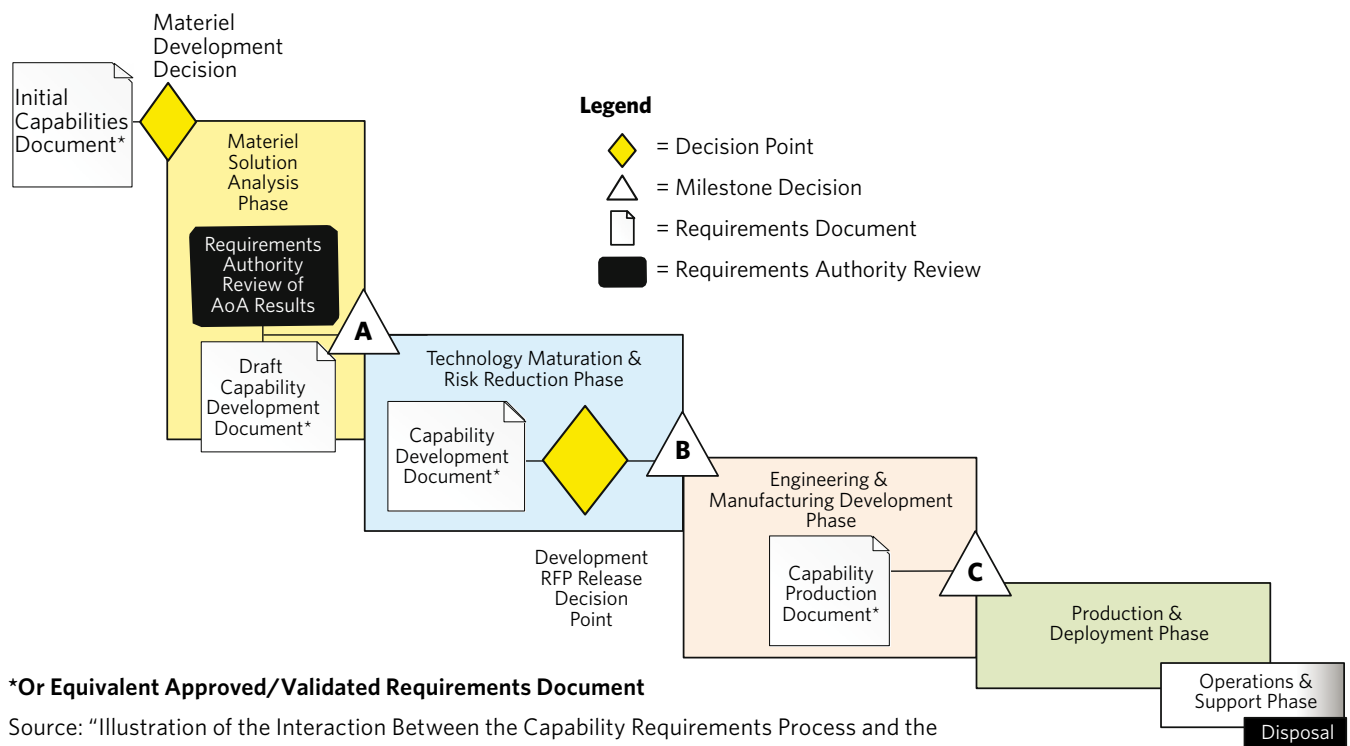
Thomas L. Conroy II, EdD

What is critical thinking as it relates to acquisition in the Department of Defense (DoD)? I think most of us understand critical thinking in our daily lives as the use of deep thinking to tackle problems. But what does it really mean in terms of DoD acquisition? I believe it is related primarily to understanding the “why” of what we do on a daily basis rather than focusing on the “what” of what we do. In other words, we need to fully understand the thinking that went behind the policy and procedures that we follow regularly. Most of us go through the processes and procedures because we have to, not because we understand fully why we should be doing them.

Conroy is a professor of Systems Engineering (Test and Evaluation) in the Capital and Northeast Region of the Defense Acquisition University at Fort Belvoir, Virginia. He holds a doctorate of education.



Figure 1. Progressing from High-Level to Technical Requirements and Specifications



The Defense Acquisition System Models

Let's think about the Defense Acquisition System (DAS) that we work in every day. We follow six models when we acquire defense systems. This is the new approach to acquisition. We formerly had but one model. The reality, however, is that we have and always have had an infinite number of models to follow, depending on what makes the most sense for our programs. We never were supposed to adhere rigorously to just one model or six models to meet all our programmatic needs for acquisition. The models always were supposed to serve as notional guidance that could be tailored to meet the specific needs of the program being developed. All programs are different and need to reflect that difference in how they are developed so they can efficiently acquire the systems our warfighters need.

If we want to tailor a system model to make it unique to our programmatic needs, we need to understand the rationale behind the models. We also need to understand the "why" behind all the piece-parts that make up each acquisition model. Ultimately, the thinking is very easily understood.

Basically, the DAS models are designed primarily for major acquisition programs that have a long production line and/or a long Operations and Support phase. The models then are designed to reduce the risk of not meeting the agreed-upon Milestone B affordable cost, achievable schedule and operational performance. Everything in the DAS hinges on Milestone B in one way or another, as I will explain.

The purpose of each phase in the DAS models is as follows:

The Materiel Solution Analysis (MSA) phase primarily is used to scope the problem defined by the user in the Initial Capabilities Document (ICD). The MSA phase is focused on scoping the solution through the user's Analysis of Alternatives (AoA). The AoA is a user-led refinement and scoping of capability needs against available and achievable technologies and affordable cost.

The Technology Maturation and Risk Reduction (TMRR) phase is used to solve the problem and determine a buildable solution as ultimately defined by the design solution that results from the Preliminary Design Review preceding Milestone B. Another way to look at the first two phases of the DAS models is that the MSA phase leading to Milestone A involves the coarse tuning of the system design solution, and the TMRR phase leading to Milestone B involves fine tuning the system design solution. We need to have a buildable solution leading into Milestone B in order to be able to fully determine a low-risk relationship between affordable cost, achievable schedule and operational performance that will be agreed upon and defined at Milestone B in the Acquisition Program Baseline (APB). The APB is informed by the Capability Development Document (CDD). The user develops the CDD to explain the capabilities the system solution needs to meet and the Initial Operational Capability (IOC) need date for the ultimately deployed system

solution. The success of the program will be based on the APB agreement for the remaining phases of the DAS models.

The Engineering and Manufacturing Development (EMD) phase now makes more sense in terms of its name. We are not using this phase to solve the problem or to design a buildable solution but rather to design a producible, maintainable solution. In other words, we use the EMD phase to design from the buildable solution, a solution that can be affordably manufactured on a production line for reduced cost and a limited defined schedule without sacrificing operational performance quality. This producible, maintainable design is the result of the Critical Design Review (CDR). The producible, maintainable design also is focused on determining the manufacturing methods required to efficiently produce the system solution on an affordable production line.

The Production and Deployment phase is focused on production, assembly and deployment of the system solution within the parameters defined by the APB as informed by the Capability Production Document (CPD). The user develops the CPD to define the capabilities that the production items must meet, as well as the necessary production line to meet the user's needs. It is an update and refinement to the CDD with additional information focused on production and delivery of the system solution.

The Operations and Support phase focuses on using and supporting the system solution in the operational environment. In this phase, we also focus on maintaining the system and upgrading or refining the system based on additional user needs as defined in the field. In using and maintaining the system, the user will discover additional needs that arise from changing threats and field conditions. Additional work may be required to support the system solution in this phase.

Summary

When all of this information is taken into account, it is easy to see how the big picture for the DAS fits together. Once you understand how it all fits together, you can see where and how to tailor and configure the DAS models to fit the specific needs of an individual and unique program. In this case, as we have said before, critical thinking is related primarily to understanding the "why" of what we do on a daily basis rather than focusing on the "what" of what we do. By fully understanding the thinking that went into the processes and procedures that we follow regularly, we can use that critical thinking to tailor those processes and procedures. In this way, we can reduce risk in our programs by making the processes and procedures as unique as the programs themselves and can reduce waste and overhead in the program structure and models. &

The author can be contacted at thomas.conroy2@dau.mil.



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The **Hard Truth** About Soft Skills

Discovering the Common Denominator in High-Stakes Environments

Joe Moschler ■ Mike McGhee

On Dec. 29, 1972, Eastern Airlines Flight 401 crashed into the Florida Everglades, killing 99 of the 163 crew members and passengers on board. The aircraft, a 4-month-old Lockheed Tristar L-1011, had taken off from John F. Kennedy Airport in New York and was en route to Miami International.

Just prior to landing in Miami, the flight crew asked for permission to hold and deal with a malfunctioning landing gear position light. The aircraft initially was 2,000 feet above the ground. During the next few minutes, the crew—distracted by the light malfunction—allowed the aircraft to descend and crash into the Everglades.

Moschler is a professor of Systems Acquisition Management at the Defense Acquisition University (DAU) Mid-Atlantic Region, and **McGhee** is a professor of Acquisition Management at the DAU Mid-Atlantic Region.

problem
solving

communication

problem
solving

situational
awareness

communication

This type of incident, although tragic, is not unique or new to aviation. Many similar such accidents still occur, especially in areas requiring a high level and degree of team or crew coordination and communication.

Overall, the safety record of U.S. air carriers is outstanding, due to factors such as improved and more reliable aircraft, navigation systems and more accurate weather forecasting. According to National Transportation Safety Board aviation accident statistics, there has been only one crash of a U.S. air carrier with fatalities in the period 2007 to the present.

However, avoidable crashes attributed to pilot error continue to happen. Of particular concern is the breakdown of communication and crew coordination in multicrew aircraft such as commercial airliners and large military aircraft. NASA was among the first agencies to address this ongoing concern in the 1970s. NASA's work revealed that the problem was driven, largely, by a lack of effective and appropriate "soft skills" versus a shortfall in techni-

cal skill or competence. Among the core findings: Even the briefest lapse in soft skills (for example, appropriate and necessary communication for the task at hand) can overcome or negate the benefits promised by years of experience, technical capability and expertise.

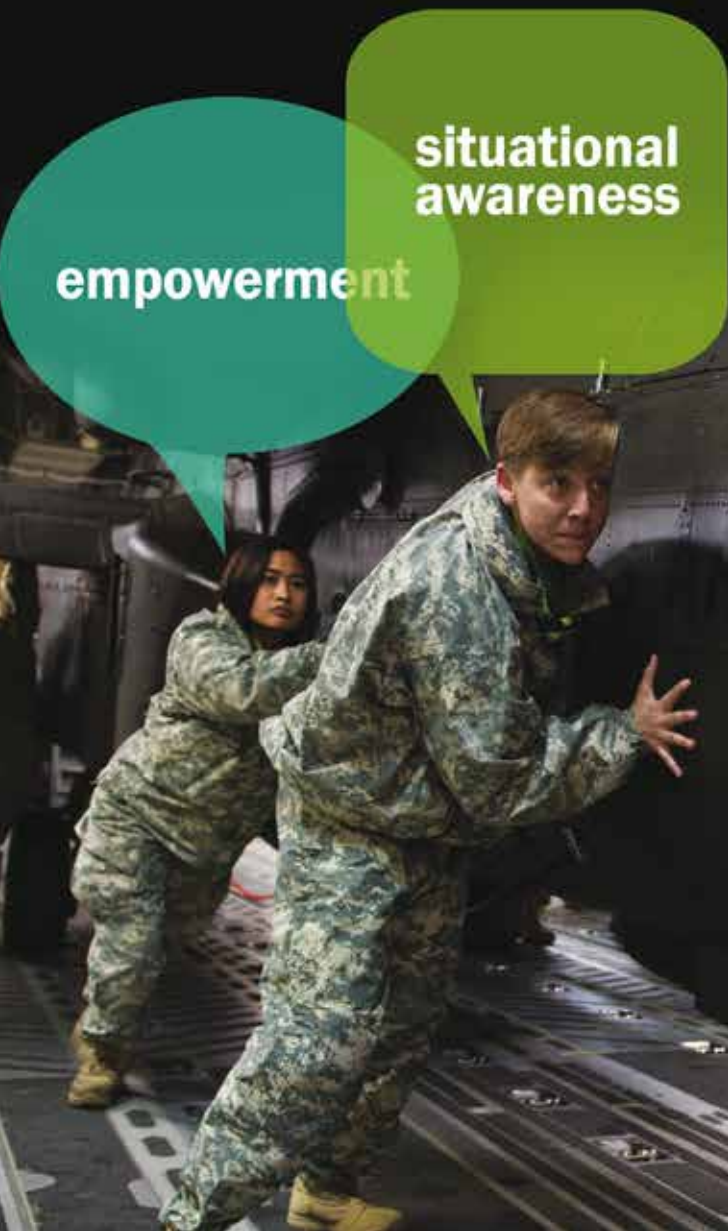
How can this be? To expand on a phrase from the movie "Cool Hand Luke," how can a simple "failure to communicate" result in such tremendous tragedy and loss of life? To paraphrase former Disney executive Lee Cockrell, the soft skills are the hard skills. That is to say, there are the "hard" (objective) technical skills, and then there is the ability to coordinate and implement those skills—and the latter requires soft skills. The implementation of these soft skills in aviation can be referred to as Crew Resource Management (CRM).

During the 1980s, the commercial airlines and military invested heavily in CRM training, aiming to increase crew coordination and improve cockpit management. These CRM training programs focused on human factors training—also called man-machine interfaces—with specific concentration on leadership and decision making.

CRM has evolved over the years with emphasis now placed on the acquisition of timely, appropriate information; and interpersonal activities including leadership, effective team formation and maintenance, problem solving, decision making, and maintaining situational awareness. One of the primary tenets of CRM is making it OK for anyone to say anything in a tactful and

empowerment

situational awareness



productive manner. All crew members should feel empowered to speak up and be part of the decision-making process.

CRM also is applied in other areas where effective interpersonal communication and coordination are of paramount importance. The medical community has endorsed “CRM-like” training for settings such as intensive care units, emergency departments and surgical units where teamwork issues may affect outcomes. More recently, the oil and gas industry has initiated steps to introduce training in cognitive, human-factor skills. Similar to CRM, these skills involve conscious mental activities such as thinking, understanding, learning and remembering. Such skills may affect situational awareness and decision making.

The adoption of this CRM-type of training by the oil and gas industry resulted from accidents such as the BP Deepwater Horizon oil spill in the Gulf of Mexico in 2010. For example, Maersk Training offers customized CRM training for oil and gas exploration and well operations. Through classroom instruction and simulation, Maersk focuses on team communication during all operations. Similarly, in 2014, Scotland’s University of Aberdeen developed a Well Operations CRM training syllabus for use with well-operations teams.

The use of CRM in high-risk areas such as aviation, medicine and the oil and gas industry comes as no surprise. However, the concept and practice of CRM can be applied in any area where the risks of poor performance are of significant consequence—such as an acquisition program office. The skills CRM focuses on are “soft skills” and all consistently are highlighted among the most important attributes for leaders in acquisition.

As far back as 2004, Dr. Owen Gadeken of the Defense Acquisition University (DAU) collected actual data from senior acquisition leaders during executive-level courses. Participants were asked to think of one or more leaders who influenced their leadership style, either positively or negatively. Out of 326 groups, with a combined total of 1,966 people, (<http://www.dau.mil/publications/DefenseATL/DATLArchivecompletepdf/may-june04.pdf>), good communication, clear vision and the ability to delegate or empower when appropriate were listed as the top three attributes by 224, 203 and 151 groups,

respectively. In two of the top three, the common thread of soft skills emerges. Still today, data from more recent and ongoing consulting efforts continue to support these findings. For example, during the DAU Mid-Atlantic Region’s Mission Assistance efforts and team-effectiveness surveys, we consistently observe and report that effective communication, the need for a clear organizational vision and the lack of empowerment and trust are among the top areas requiring attention or significant improvement. This list entails both soft skills and desired end states resulting from the effective implementation of soft skills. Likewise, CRM is a means to an end—it is a tool that embodies and promotes the use of relevant soft skills.

So how might a program office implement a technique like CRM? For our purposes, let’s refer to CRM as “Program Team” Resource Management. First, program leadership must commit to abide by the premises of CRM (e.g., open communication, situational awareness and empowerment to speak freely and candidly, all of which contribute to a clear vision).

One program manager (PM) recently shared with his acquisition team how, before every flight when

he was a military aircraft commander, he would cross his arms over his chest and put his hands on his shoulders to cover his rank insignia. He assured the team members that if at any time any one of them became aware of an issue he or she perceived as having even the slightest possibility of impacting personnel safety or the success of the mission in any way, rank was not to be a consideration. Every crew member was completely free—and even had an obligation—to bring up any topic that person perceived to be of any potential consequence. The PM’s point in sharing the story with his program team was just as clear: In order for an acquisition team to be effective, a vision must be established on common values. This empowers and motivates team members to speak up any time they perceive even the slightest threat to program success. Once this kind of commitment and trust is established within a team, more formalized training to improve the teams’ soft skills and the subsequent implementation of the same may be appropriate.

So what type of formalized tools are available to help program offices implement “Program Team” Resource Management?

One of the primary tenets of CRM is making it OK for anyone to say anything in a tactful and productive manner. All crew members should feel empowered to speak up and be part of the decision-making process.

They are numerous! At DAU, we often combine many of the more reputable and commercially available products with DAU Mission Assistance and consulting efforts (e.g., The Center for Applications of Psychological Type “Myers Briggs Type Indicator”); Vital Smarts “Crucial Conversations”, “Crucial Accountability” and “Influencer”; and Covey’s “Seven Habits ...” and “...Speed of Trust”, to name a few). Additionally, Internet sites such as MindTools (<https://www.mindtools.com>), and CultureSync (<http://www.culturesync.net>) provide open-source resources. All of these tend to start with a focus on self-awareness to help us first recognize how each of us tends to contribute to the problems and issues affecting us, instead of starting by projecting our own faults onto others. Other tools focus on changing behaviors to obtain better results, manage conflict, promote critical thinking and instill trust. And this is only a partial list. Search the Internet or refer to the *DAU iCatalog* for a more detailed and complete listing of potential resources (http://icatalog.dau.mil/onlinecatalog/targeted_training.aspx).

As described, these training programs focus on different aspects of the soft skills such as self-awareness, effective communication, leading change and instilling trust. When properly presented and implemented, these tools can equip program teams to prevent programs from stalling or experiencing the programmatic equivalent of “controlled flight into terrain.”

The following is an anecdotal example of how the need for soft skills frequently come into play and how their proper use can pay great dividends. At an Acquisition Program Transition Workshop (APTW), a program had just received Milestone B approval, made a subsequent contract award, and was pressing hard toward an Integrated Baseline Review. APTWs are an Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L])/industry partnership initiative to facilitate an effective Milestone transition, typically in conjunction with a contract award. In this case, most of the attendees did not want to be there, but the USD(AT&L) had “highly encouraged” programs to consider holding APTWs. So there we were The PM also did not really see the need for an APTW and tried to pass it off to the deputy PM. Utilizing Crucial Conversations skills to establish “mutual purpose” and “mutual respect,” the PM reviewed with the DAU Mid-Atlantic team what he really wanted to achieve as part of the APTW outcomes.

As a result, the teams that previously indicated they had “real work to do” and felt they didn’t have time for such “soft-skill hokum,” followed the PM’s lead and saw fit to participate in our “waste-of-time” soft-skill drills. The next morning, after an afternoon of work accomplished from the previous day, the integrated product teams (IPTs) briefed out their answers to three simple questions intended to promote reflection and introspection. To their amazement, meaningful conversations emerged. Most, if not all, participants came to realize they were all, at least to some degree, fixated on issues that were “urgent” for their IPT but not so “important” to the program’s overall success. The crucial moment came when


each IPT had presented the importance of software (SW) to their team’s success. And yet when the PM pointed out the individual responsible for overall integration of SW for the program, none of the other team members even knew the person existed; he or she hadn’t been invited to meetings and there was virtually no coordination or correlation between the different IPTs. This event drove home just how important communication and the many other soft skills are to help programs succeed. DAU has experienced similar results in numerous deep dive, workshop and training events with teams.

In this scenario, a breakdown in safeguards and programmatic mitigation efforts aligned to create potential negative cost, schedule and performance impacts to the program. Knowledge and implementation of soft skills will not guarantee program success. Just as with CRM, effective “Program Team” Resource Management can keep leadership apprised of program challenges and issues and head off potential crises through timely communication and situational awareness. Additionally, the program team needs to be cognizant of some of the indirect ways programs can fail through any one or a combination of soft-skill voids.

Conclusion

As discussed previously, despite years of improvements in aircraft, aviation technology and weather forecasting, preventable aircraft accidents still occur. Certainly CRM has evolved and is used extensively across all facets of aviation and beyond. However, there is still room for improvement.

Even so, the tenets of CRM—or “Program Team” Resource Management, as we have coined it—can be applied to the complex management of today’s acquisition programs. One of the fundamental aspects of the approach is the application of soft skills. Although there is no guarantee for success, mastery of the requisite soft skills associated with “Program Team” Resource Management can improve decision making through more effective communication, empowered teams and heightened situational awareness. It all starts with program leadership fostering an atmosphere of trust and openness to candid discussions without fear of retribution. As a result, the probability of a success-oriented culture is vastly improved.

When baseball legend Cal Ripken was asked about his amazing accomplishment of being in the starting lineup for 2,632 consecutive professional baseball games over more than 16 years, he indicated he didn’t count on luck but gave himself a chance to be lucky by addressing all the risks that were within his span of control. This same mentality, including maximizing the effective use of “soft skills,” is essential for an acquisition program to improve performance and enhance chances for a successful program. 

The authors can be contacted at joe.moschler@dau.mil and mike.mcgee@dau.mil.

Pursuit of the Possible

USSOCOM's Technical Experimentation Program

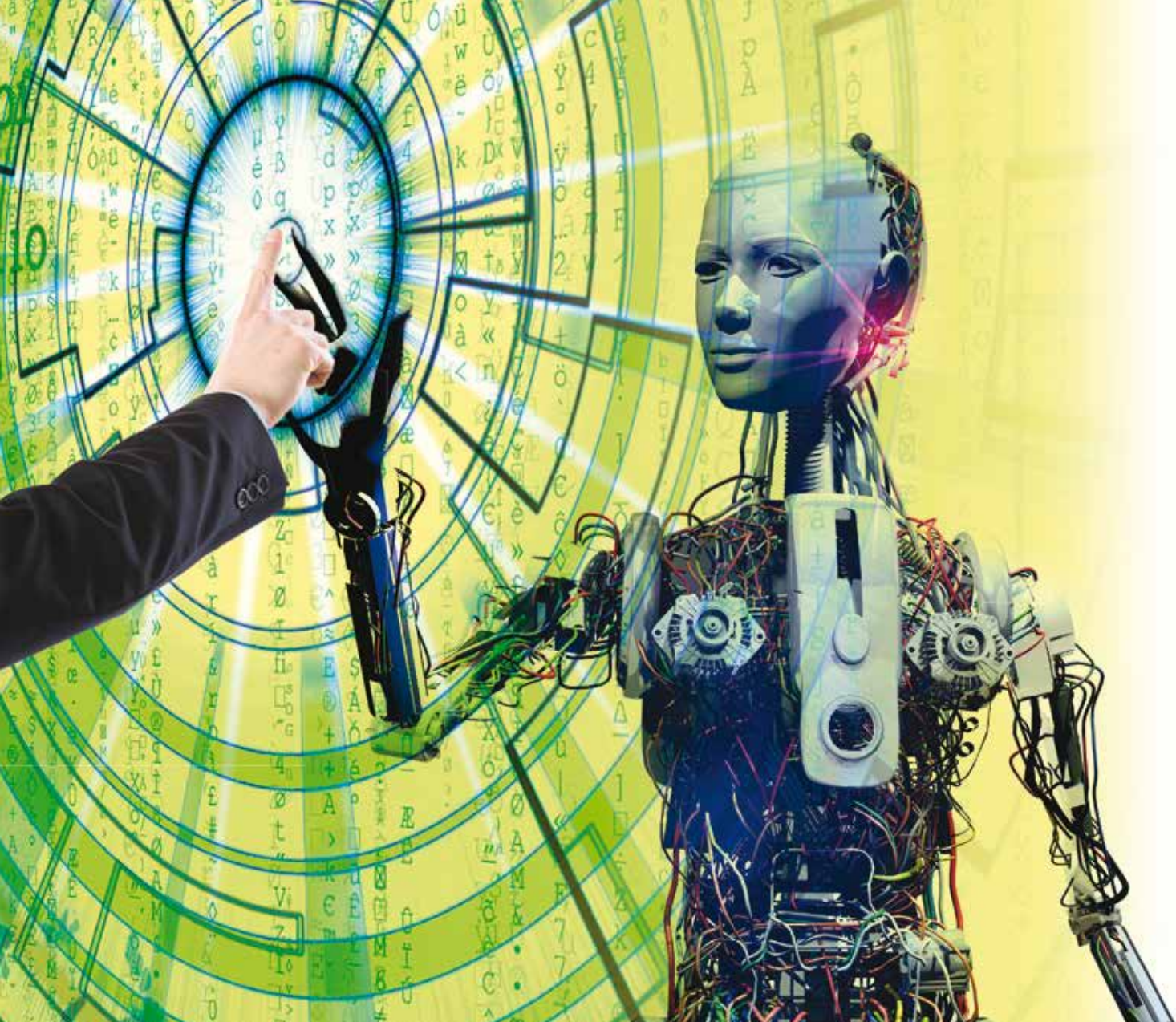
Tom McGowan



The U.S. Special Operations Command (USSOCOM) Technical Experimentation (TE) program brings together Special Operations Forces (SOF) operational users, acquisition program managers and technology developers (industry, government research and development labs and academia) in a collaborative environment to evaluate new technologies currently being developed.

Under the sponsorship of the USSOCOM Science and Technology Directorate, these events are conducted throughout the year to rapidly assess the technical maturity and potential military utility of technologies, based on the areas of need identified by the USSOCOM Components, Theater Special Operations Commands (TSOCs) and Program Executive Offices (PEOs). Typically, the Directorate conducts three to four events yearly, at various military installations throughout the United States, often in field conditions. Depending on the need, the events focus on a broad operational theme or a specific capability area.

McGowan is a former U.S. Special Operations Command Deputy Program Executive Officer-Special Programs and now is supporting the Science and Technology Directorate's Technical Experimentation program. He is a retired Marine lieutenant colonel with more than 43 years of service with the Department of Defense.



During the events, technology developers describe and then physically demonstrate the current function and performance level of their technology products. In many instances, operators participate (hands on) in the demonstrations or experiments to more accurately evaluate the technology and provide constructive feedback to the developer. There are numerous benefits of these events, including discovery of emerging technologies, assessment of potential utility to SOF, program/project risk reduction, cost savings to developers, and, in general, promotion of technology information exchange between all participants. All TE events are held at the unclassified level to maximize participation by developers.

USSOCOM's TE program has evolved from a joint venture between USSOCOM and the Naval Post Graduate School (NPS) originally called Surveillance and Target Acquisition Network and later renamed Tactical Network Topologies (TNT). The TNT program drew many

of its technology topics from the efforts of NPS graduate students and primarily was characterized by networks, sensors and unmanned aerial systems experimentation. This program followed a quarterly schedule with a 2-week format. The first week consisted of technology-driven Capability Based Assessments and the second week featured tactical-scenario-driven Mission Based Assessments. Over time, diminishing funding and schedule and/or program issues drove the joint effort to evolve into three separate efforts. Although similar in appearance, these three programs are distinctly different:

- **Joint Interagency Field Experimentation:** Conducted by NPS, primarily at Camp Roberts, California, and other West Coast venues. The focus remains driven by NPS educational goals with experiments/demonstrations typically at lower Technology Readiness Levels.

A very important aspect of these events is that they are not designed as a marketing event or trade show but rather as a venue where developer engineers can come out and experiment with their technology.



- Technical Support Operational Analysis: Sponsored by the Assistant Secretary of the Army for Acquisition, Logistics and Technology and conducted by Army Adaptive Red Team at venues throughout the country. These events feature scenario-based experiments of relatively mature technology.
- TE: Conducted by USSOCOM specifically to address capability areas identified by USSOCOM Service Components, TSOCs and PEOs. TEs typically include equipment characterized as of midrange technical maturity, usually too immature for scenario-based events.

Players: The three key groups that participate in TE are the SOF operational user community, program managers and technology developers. Each group has a critical impact on technology development, and each has something to gain from the events. The operational users are representatives from each of the USSOCOM Service Components: United States Army Special Operations Command, Naval Special Warfare Command, Air Force Special Operations Command, Joint Special Operations Command, and the Marine Corps Forces Special Operations Command. Program managers and government project officers are primarily from USSOCOM's six commodity focused Program Executive Offices (Maritime, Fixed Wing, Rotary Wing, SOF Warrior, C4, Special Reconnaissance, Surveillance and Exploitation [SR]). USSOCOM Science and Technology Directorate's technology development leaders also are engaged throughout the process.

Technology developers can be from government organizations, academia or industry, with a large percentage of industry participants coming from small businesses.

Process: Themes and venues for TE events are developed annually and are based on input from USSOCOM Service Components and PEOs. The event process is initiated with a Request for Information (RFI) posted on Federal Business Opportunities (FBO.gov) approximately 4 months prior to the event. The RFI specifies the theme(s), technology areas of interest for the particular event, the submission format and other requirements. Technology developers respond

Patriot 3 Inc.'s Jet Boots and Shark Marine Technologies Inc.'s Subnet Diver to Diver to Surface Data Communications, and a diver ready for action.

Photo by SSG Ian Brown, USSOCOM

to the RFI with a white paper describing their technology and experiment qualifications. When the RFI closes (usually 30 days after opening), the TE team disseminates the submissions to USSOCOM PEOs, Service Components and TSOCs for review and selection. Based on this feedback and voting, selected nominees are invited to participate in the TE event. This notification or invitation usually happens approximately 45 days but never less than 30 days prior to the event. During this same time, there is coordination for assessors from each of the USSOCOM Service Components. Depending on availability, a minimum of four to eight representatives from each of the Service Components attend. They are augmented by assessors from the PEOs and other USSOCOM Headquarters elements. All assessors provide written feedback to the TE team, which is subsequently disseminated to the technology developers.

A very important aspect of these events is that they are not designed as marketing events or trade shows but rather as venues where developer engineers can come out and experiment with their technology.



Above: Morning briefing on maritime diving equipment and how it will be used in operations.

Photo by SSG Ian Brown, USSOCOM

Below: Ad hoc experiment with a Shark Marine-equipped diver on the move.

Photo by SSG Ian Brown, USSOCOM



Benefits: For USSOCOM, the events provide the opportunity for program management personnel, engineers and operators to identify and evaluate potential technology solutions to current capability gaps. Operational users get to evaluate the latest technology developments that may address needs relevant to their command. Program managers have the opportunity to evaluate emerging technologies pertinent to their portfolios and to establish awareness of companies that operate in their particular interest areas. The payoff for participating technology developers includes the unique opportunity to interact face to face with SOF operational personnel and other members of the SOF community. This significantly increases their understanding of how their technology may be

employed by the SOF community and in what direction their future development efforts should be focused. This can help conserve the developer's independent research and development dollars, refine developmental focus and shorten development cycles. Another spinoff benefit of these events is the opportunity for the technology developers to collaborate and integrate their technologies with each other during the event. These occurrences, referred to as "ad hoc" experiments, often produce very valuable lessons learned.

Recent Events

■ *TE 16-1 Biomedical and Sensitive Site Exploitation on Dec. 1-3, 2015, at the National Forensic Science Technology Center in Largo, Florida.* TE 16-1 focused on technologies that support medical training and/or simulations and Sensitive Site Exploitation. The technologies evaluated included replica physiological and environmental phenomena, high-fidelity human surgical and medical simulators, canine medical simulations as well as multiple portable biological agent/explosives detection devices. A good example of an ad hoc

experiment is the photo at left.

■ *TE 16-2 Command, Control, Communications, and Computers and Mobility on March 7-11, 2016, at Camp Roberts in California.* TE 16-2 focused on mobile ad hoc network radio systems, ground and air commercial and military vehicle networking architectures and systems, reliable network security standards, encryption algorithms, commercial solutions for classified architectures to the end user's device, securing one-to-one or one-to-many video collaboration architectures for mobile devices, and software-defined networking for tactical environments, etc. As part of the

mobility theme, operators evaluated armored vehicle extraction tools, tools and devices to lift the vehicle or breach the vehicles armor without injuring the occupants. Several follow-up and more in-depth technology assessments are anticipated as a result of this event.


Planned Events and New Developments

■ *TE 16-3 Urban Operations/Unconventional Warfare July 11-15, 2016, at the Camp Atterbury-Muscatatuck Center for Complex Operations in Indiana.* The TE 16-3 event focuses on technologies capable of supporting urban, unconventional warfare operations. The typical technologies of interest for this event include: the ability to communicate and navigate in a Global Positioning System degraded environment, navigational accuracy, Intelligence, Surveillance, Reconnaissance (ISR) technologies, unmanned systems, scalable effects weapons, employment of weapons, concealable soft body armor, social network analysis, improved visual augmentation devices and standoff weapon/explosive detection devices, just to name a few.

■ *TE 16-4 Maritime surface operations, Sept. 19-23, 2016, in Virginia Beach, Virginia.* TE 16-4 will focus on technologies applicable to current and future SOF maritime craft. Typical technologies of interest may include improved communications/antennas, navigational devices, ISR technologies, shock mitigation, ballistic protection and active ride control.

New developments for the TE program include:

- Reducing the length of the events from 2 weeks to 1 week. This has created a refined focus and selectivity on desired technologies, increased the availability/participation of government programmatic and operational assessors, while enabling increased participation by small businesses.
- Improving the TE programs presence on social media. The TE program can now be found on Facebook (<https://www.facebook.com/SOCOMTE>), LinkedIn (<https://www.linkedin.com/groups/6559158/profile>) and Twitter (<https://twitter.com/SOCOMTE>). These sites provide a great way to stay up to date on TE program developments and news.
- Providing written assessment and feedback to all technology developers who participate in the events. This written feedback is an addition to any verbal feedback received at the event. This is a significant improvement over the past practice of providing only verbal feedback.

The USSOCOM TE program will continue expanding SOF's awareness of emerging technologies while offering technology developers the opportunity to collaborate with SOF operators and the acquisition community. For more information on the TE program, readers should visit the TE website at: <http://www.socom.mil/sordac/Pages/ExpWithUS.aspx>. 

The author can be contacted at thomas.mcgowan.ctr@socom.mil.

PROGRAM MANAGERS e-TOOL KIT

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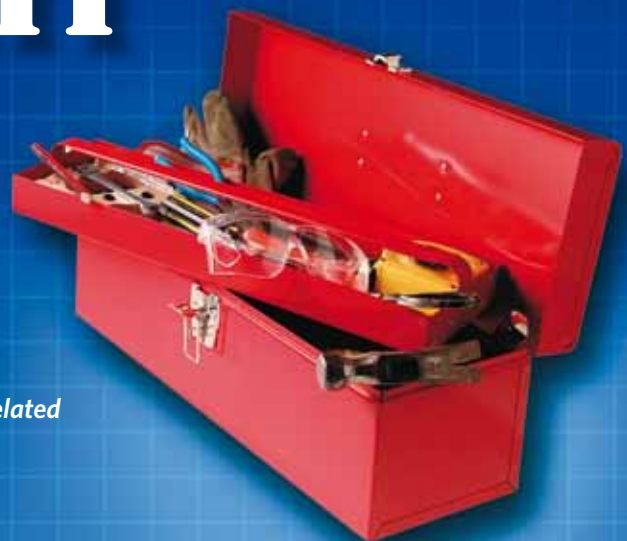
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Do's and Don'ts

for Conditional Acceptance of Nonconforming Supplies or Services

Anthony J. Nicolella

If you stay in Department of Defense (DoD) contracting long enough, you will have to deal with the dreaded issue of contractors trying to deliver nonconforming supplies or services. As a government contracting professional, you have quite a few options in dealing with this problem, including conditional acceptance. The purpose of this article is, first, to share a personal experience I had with conditional acceptance, and, second, to discuss some of the do's and don'ts of conditionally accepting nonconforming items.

Before going any further, let's determine what is meant by "conditional acceptance." According to Federal Acquisition Regulation (FAR) 46.101, conditional acceptance means "acceptance of supplies or services that do not conform to contract quality requirements, or are otherwise incomplete, that the contractor is required to correct or otherwise complete by a specified date." Conditional acceptance is not supposed to be a long-term solution but an option that the government can consider if it is in the government's best interest to do so.

The first time I had to deal with a nonconforming item was as an administrative contracting officer (ACO) of a major Army acquisition weapon system. I had just been appointed the ACO and one of my first tasks was to approve several conditional DD Form 250s—Material Inspection and Receiving Reports. After speaking with the Quality Assurance (QA) Division Chief, I discovered that our agency had been conditionally accepting this weapon system for several months. Only a few select people like the former ACO, project manager (PM), commander, and QA chief in the agency knew about this. After researching the circumstances surrounding this decision, it became apparent to me why this action was being kept close hold.

Nicolella is a professor of Contract Management at the Defense Acquisition University's South Region in Huntsville, Alabama.



U.S. Army Staff Sgt. Joshua Wheeler fabricates a metal mud flap bracket for a vehicle on Joint Base Balad, Iraq, in 2009.
Department of Defense photo.

As a brand-new ACO unfamiliar with conditional acceptance, I decided to investigate this concept further before making any decision. What I already knew was that the weapon system in question was not a new one but one that had been around for quite some time. Because of this, I was perplexed as to how a legacy system of this caliber and in its third year of production could have a critical nonconformance issue. There had been no change to the production process, no change to major subcomponents, and no change to subcontractors or main suppliers. So why is this happening at this time in the contract's period of performance (POP)? Is conditionally accepting this weapon system in the best interest of the government?

Finally, and most important, what am I going to do about it? My first step was to read the *FAR Section 46.407* on Nonconforming Supplies or Services. This section provides many viable options in dealing with nonconforming items and the contractors providing them. After reading this *FAR* section, one would think conditional acceptance would be an effective way of dealing with a nonconformance issue. This might be true, but only after a number of conditions have been met, including strict adherence to the *FAR Section 46.407* which, unfortunately, had not happened.

In our case, conditional acceptance meant that the contractor got full payment and credit for an on-time delivery. Was this in the government's best interest? To answer this question, we need to review *FAR 46.407 (c)(1)*, which states that a contracting officer's determination of whether acceptance or conditional acceptance is in the government's best interest must be based on:

- Getting advice from the technical activity that the item is safe to use and will perform as intended
- Gathering information about the nature and extent of the nonconforming item
- A contractor request for acceptance of the nonconforming item
- A recommendation for conditional acceptance or rejections with supporting rationale
- Considering contract adjustment, if appropriate

Let's take each of the above items one at a time. First, get advice from the technical activity that the item is safe to use and will perform as intended. This did happen, and the advice, according to the QA chief, was not to conditionally accept the item because the nonconformance was critical. According to *FAR 2.101* and *FAR 46.101*, a critical nonconformance means "a nonconformance that is likely to result in hazardous or unsafe conditions for individuals using, maintaining or depending upon the supplies or services; or is likely to prevent performance of a vital agency mission."

While *FAR 46.407(c)(1)* does allow acceptance or conditional acceptance of a nonconforming item with a critical nonconformance in appropriate circumstances such as "economy or urgency," *FAR 46.407(c)(2)* requires that "Before making a decision to accept, the contracting officer must obtain the concurrence of the activity responsible for the technical requirements of the contract" Here, the technical activity not only did not concur but it actually recommended rejecting the nonconforming goods.

Second, gather information regarding the nature and extent of the nonconforming item. This issue was quality related and impacted U.S. and Foreign Military Sales (FMS) contracts. The contractor promised to fix the problem “sometime in the near future.” The government accepted this “soft” promise rather than setting a firm date by which the deficiency would have to be corrected (or the conditional acceptance revoked), as required by the very definition of conditional acceptance in FAR 46.101 (“... contractor is required to correct or otherwise complete by a specified date”). The government assumed that this fix would be made at no additional cost to the government. The fix required the swapping out of parts. However, since the fix would take several months to complete, contractor teams

Was conditionally accepting the weapon system, in this case, in the best interest of the government? Based on the requirements of FAR 46.407 (c)(1), it does not appear so. Besides failing to adhere to FAR 46.407(c)(1), the government did not comply with FAR 46.407 (e) or (f). In reference to paragraph (e), the ACO by his or her actions or inactions (failure to withhold monies, failure to establish a firm date for fix, failure to obtain the concurrence of the activity responsible for the technical requirements of the contract, etc.), did not discourage the repeated tender of nonconforming supplies. To the contrary, his or her actions or inactions encouraged the contractor to repeat and perpetuate the issue month after month. In reference to paragraph (f),

This is not to imply that conditional acceptance is not a viable option when dealing with a nonconformance issue; it may be. DoD contracting professionals must look at and consider a number of factors when contemplating conditional acceptance.

would be needed to periodically perform checks such as starting equipment, replacing batteries (if needed), exercising the hydraulics system, etc., in order to keep weapon system in good working order. The contractor submitted a cost proposal to the government for this additional work. Since hundreds of weapon systems were impacted, these ancillary costs were material and growing each day.

Regarding the last three items (Numbers 3, 4 and 5), since nothing was documented in the contract file, it was assumed that no written request, recommendation or adjustment was submitted to or considered by the ACO. This does not bode well for the government. The contractor on the other hand was enjoying full payment and credit for on-time delivery of its nonconforming item.

So going back to my original three questions:

Why was this happening at this time in the contract POP? I could not really find an answer to this question. I can only speculate. Up to this point, the contractor was performing well on the contract. The end user and other stakeholders were very happy with the contractor and the item produced. The contractor assumed (correctly) that if it asked the government to do a conditional acceptance, the government would accommodate that request. Out of all the choices (reject, rework at no additional cost, replacement or terminate for default) available under FAR sub-part 46.407 to the government, conditional acceptance was probably thought to be the easiest and most expeditious choice. But for whom? Government complacency also may have played a role in its decision.

when accepting supplies with a critical nonconformance, the ACO must modify the contract to provide for an equitable price reduction or other consideration. The government did not modify the contract or receive an equitable adjustment or any type of consideration in return.

What am I going to do about it? After speaking with the PM and other concerned government acquisition team members, as well as legal counsel, about our conditional acceptance approach, I discontinued conditionally accepting this item. The contractor balked at the decision and tried to claim that this was a past practice and that a precedent had been set. Yes, and a bad, totally one-sided precedent. Faced with a united government acquisition team, the contractor grudgingly gave up its quest to seek further conditional acceptance of its nonconforming item.

This is not to imply that conditional acceptance is not a viable option when dealing with a nonconformance issue; it may be. DoD contracting professionals must look at and consider a number of factors when contemplating conditional acceptance. Some of the “Do’s” of conditional acceptance are:

Do safeguard the government’s interest by doing extensive research of the FAR/Defense Federal Acquisition Regulation Supplement and by strictly adhering to the guidance of FAR Section 46.407, including the requirement to obtain technical concurrence.

Do properly document the contract file. Good or bad, this information needs to make it into the contract file to ensure others,



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including future contracting officers, are aware of the decisions made and, importantly, the rationale for those decisions.

Do ensure you have a well-informed and united government acquisition team. When it comes to contractual issues, the ACO is the decision maker of the government acquisition team. In this role, one must establish open and honest communications with each team member, ensure everyone is educated on the issue at hand and united in the approach to resolve it.

Do understand your contract's terms and conditions so you and your team can perform contract administration properly.

Do have the moral courage to make an unpopular decision when that decision is in the best interest of the government.

In reference to Number 5 above, I cannot stress enough the importance of having the moral courage to make an unpopular decision when doing so is in the best interest of the government. No amount of training can prepare a person for this. As business advisors and warranted contracting professionals, we must do the right thing, even when doing the right thing is unpopular with not only the contractor but with some members of our own government acquisition team.

In hindsight, the government's decision to grant the contractor conditional acceptance was not wise, and that brings us to some of the "Don'ts" of conditional acceptance:


Don't make a decision that is not clearly in the best interest of the government.

Don't fail to properly document the contract file. This is a cardinal sin in contracting. There is an old saying in contracting, "If it is not documented, then it never happened."

Don't be a non-team player. The government acquisition team did not work well together in this case. Much of the blame lies with the ACO since he or she had the warrant and thus the authority. However, other key leaders were misinformed, ignorant or unengaged regarding the nature or extent of the conditional acceptance.

Don't become complacent. Complacency combined with too much faith in the contractor's judgment and intentions may have allowed this situation to continue longer than it should have.

Don't take the path of least resistance or base your decision solely on ease and expediency.

When contemplating conditional acceptance, remember to focus on accomplishing the "Do's" and avoiding the "Don'ts." The old adage that "Some of the best lessons learned are sometimes learned the hard way" is not one to live by in contracting because even a single lesson learned the hard way may involve a price that is too high for us to pay. 

The author can be contacted at anthony.nicolella@dau.mil.



Cybersecurity

The Road Ahead for Defense Acquisition

Steve Mills ■ Steve Monks

The May-June 2014 edition on *Defense AT&L* magazine included an article by Under Secretary of Defense for Acquisition, Technology, and Logistics Frank Kendall, titled “Protecting the Future,” which stressed Kendall’s concern about the United States’ ability to maintain its technological superiority.

Maintaining that superiority is based not only on adequate funding for leaps in technology but also on honing that technology to protect the capability against cybersecurity threats. The cyber threat we face every day is one of the greatest risks to our ability in developing, delivering and sustaining our warfighting capability. It is dynamic, adaptable and resilient, with an insidious effect on the accomplishment of the mission.

Over the last two decades, our weapon systems have become more interconnected. We now are in a system-of-systems world. Those weapon systems have become more lethal with the advent of better shared situational awareness and the ability to realize the capabilities of coordinated weapon systems that are greater than the sum of the parts. We have invested greatly in this. Today our systems are the best in the world and continue to ensure our dominance on the battlefield. However, that investment has brought greater dependence and risk. The cyber threat is growing at an increasing rate, and has the potential to significantly degrade and even eliminate our advantage on the current and future battlefield. The risks to our Department of Defense (DoD) systems have reached the point

Mills and Monks are professors of Program Management at the Defense Acquisition University’s South Region in Huntsville, Alabama, where Mills also is the Region’s Cyber Lead.

where we must change our thinking about how to combat this threat and who is responsible or involved in this fight.

How vulnerable and resilient are DoD systems against the cyber threat today? Unfortunately, testing continues to show our systems to be extremely vulnerable to the cyber threat. According to a Defense Science Board (DSB) study completed in January 2013 and titled “Resilient Military Systems and the Advanced Cyber Threat,” several key findings provide great insight:

- “Current DoD actions, though numerous are fragmented. Thus, DoD is not prepared to defend against this threat.”
- “DoD Red Teams, using cyber-attack tools which can be downloaded from the internet, are very successful at defeating our systems.”
- “With present capabilities and technology it is not possible to defend with confidence against the most sophisticated cyber-attacks.”
- “It will take years for the Department to build an effective response to the cyber threat to include elements of deterrence, mission assurance and offensive cyber capabilities.”

Additionally, more recent testing demonstrates our inability to significantly reduce this risk. *The Director, Operational Test and Evaluation (DOT&E) Fiscal Year (FY) 2014 Annual Report* reveals several disturbing trends:

- Operational testing still found exploitable cyber vulnerabilities that earlier technical testing could have mitigated.
- Many of the vulnerabilities found were common and easy to address including unnecessary network services or system functions as well as misconfigured, unpatched or outdated software.

Clearly, the DoD has a lot of work to do to reverse the trend. In response to these trends and the growing cyber threat, Kendall commissioned three additional DSB Task Force Studies on the following cybersecurity focus areas:

- Cyber Supply Chain—Practices to prevent parts that contain malicious defects or malware
- Cyber Deterrence—Policy, Operational, and Technological imperatives
- Cyber Defense—How to inform future investment priorities for cybersecurity

These studies will provide additional insight into how to mitigate the cyber threat. Once the findings are released, we will need the attention and support of the entire acquisition workforce and user community to meet this threat head on.

Effective cybersecurity of DoD acquisition programs is first and foremost “leader business.” Few other aspects of our weapon systems possess the potential cost, schedule, performance and risk impacts of cybersecurity. Cybersecurity impacts all facets of our acquisition programs. Leaders are quickly acknowledging the importance of cybersecurity as it

relates to acquisition programs but often fail to understand that successfully addressing it in their programs is more than just a funding issue. While increased funding to address cybersecurity in acquisition programs may be required, the solution set is much more. Effective cybersecurity in DoD acquisition programs involves many other aspects such as:

- Cybersecurity leadership—Top management support for program cybersecurity
- Knowledgeable workforce (including leadership) on cybersecurity principles, risks and opportunities
- Treating cybersecurity as a true design consideration versus as an afterthought and/or “unfunded mandate”

Furthermore, leaders both expect and demand that our systems operate effectively in their intended environment. Leaders are quickly realizing the enormity of the cyber threat and that we now operate in a cyber-contested environment. Cybersecurity being treated as key “leader business” is critical to the overall cybersecurity posture of our DoD acquisition programs.

A key challenge for DoD acquisition addressing the cyber threat is how do we “bake in” cybersecurity for our DoD acquisition programs vs. “bolting it on.” The dominant focus of our cybersecurity efforts today is how to secure systems that are already in the inventory. To effectively integrate cybersecurity into our DoD acquisition systems, we must change our cybersecurity focus from a reactive to a proactive, “shift left” approach. The DoD acquisition enterprise has an obligation to build systems that in the future will minimize real-time cybersecurity crises that cue reactionary measures to mitigate the damage. If we stay in the reactive mode and depend on others within the DoD to address the changing threat, we ultimately will lose our crucial ability to retain the initiative and act within the enemy’s decision cycle. We must execute a shift in this fight and become proactive in every way possible regarding the cyber threat. “Bolting on” cybersecurity solutions is ineffective. The DSB Study of 2013 validates this. This drives greater cost, higher risk and a non-optimal result.

Our proactive, shift left cybersecurity approach must begin with addressing the warfighter’s requirement. How do we ensure that requirements documents clearly articulate the cybersecurity need? To be sure, the acquisition community and the resources that propel our work is fairly bound by vetted requirements. Just as we have an obligation of trust to deliver secure systems so too do we depend upon the requirements community to get the requirements right. The user community and the Joint Capabilities Integration and Development System (JCIDS) process are our path to ensuring we have the right requirements; it is vital that JCIDS take up the mantle for developing operationally meaningful and proactive cybersecurity effort within the DoD. Our cybersecurity focus must be continually guided by the key JCIDS documents (Initial Capabilities Document, Capability Development Document and Capability Production Document). The designs of our sys-

A key challenge for DoD acquisition addressing the cyber threat is how do we “bake in” cybersecurity for our DoD acquisition programs vs. “bolting it on.”

tems are impacted by numerous considerations, which include different operating environments and possible threats posed within the air, land, sea, space and cyberspace domains. These considerations clearly help ensure our systems are both effective and suitable for the warfighter.

In an effort to better define cybersecurity requirements as they relate to our warfighting systems, the Joint Requirements Oversight Council (JROC) issued a JROC Memorandum (JROCM) on June 3, 2015, regarding cybersecurity and its relationship to the System Survivability Key Performance Parameter (KPP). This JROCM titled, *Process to Develop Cyber Survivability Endorsement to the System Survivability KPP*, asked the Services to “nominate one of their JCIDS military needs documents as use cases” for this effort. The big question is whether or not this effort generates something other than just more cybersecurity controls and/or compliance items. While critically important to achieving and maintaining “cyber hygiene,” cybersecurity controls and compliance with those controls are only parts of the solution set. In the end, cybersecurity in weapon systems acquisition is primarily about operational resiliency in a cyber-contested environment. Achieving this state remains our challenge.

The next critical component of effective and proactive cybersecurity integration into our DoD programs is to treat cybersecurity as a design consideration throughout the entire acquisition life cycle. How do we ensure that cybersecurity is treated as a design consideration with the same pedigree as other critical “ilities” versus being relegated to somewhat ad hoc efforts that are considered only at test time, and sometimes after the production decision? The concept of “shift left” from both a System Security Engineering (SSE) and T&E perspective is where we must go. Shift left from an SSE and T&E perspective is all about proactively addressing cybersecurity requirements “up front and early” in the acquisition life cycle. “Our challenge is to fully integrate cybersecurity into our test processes to help programs identify risks, minimize the attack surface and reduce kill chain effects to improve resiliency.” (Steven J. Hutchison, *Defense AT&L* magazine, January-February 2015). To be effective and ultimately successful, cybersecurity must be “baked in” the design of our warfighting systems.

Supporting policy and best practices for effective cybersecurity in acquisition programs is another critical component that must be present. There has been significant progress in this area. The recently released *PM Guidebook for Integrating the Cybersecurity Risk Management Framework* (RMF) into the System Acquisition Lifecycle (https://acc.dau.mil/adl/en-US/722603/file/80119/Cybersecurity%20Guidebook%20v1_0%20with%20publication%20notice.pdf) provides clear

guidance on how cybersecurity is integrated into the acquisition life cycle. *The Program Manager’s Guidebook* also provides two excellent examples of how the RMF is implemented across the acquisition life cycle by acquisition phase. These examples help both leaders and acquisition workforce members gain insight into application of cybersecurity principles.

A key capability for effective integration of cybersecurity into our acquisition programs is through robust T&E in support of the system engineering effort. The recently released *Cybersecurity Test and Evaluation Guidebook* dated July 1, 2015 (http://www.dote.osd.mil/docs/TempGuide3/Cybersecurity_TE_Guidebook_July1_2015_v1_0.pdf) provides clear guidelines and best practices to support ongoing and future cybersecurity T&E. This guidebook is divided into two key components. The first component provides essential information for T&E personnel on how to effectively support the RMF. The remaining component describes and addresses the implementation of cybersecurity T&E across the acquisition life cycle. Combining the T&E-related guidance provided by the cybersecurity T&E with the overarching focus of the *Program Manager’s Guidebook for Integrating the Risk Management Framework* provides both leaders and acquisition workforce member’s critical insight into how cybersecurity should be integrated into the DoD acquisition life cycle.

Who in the acquisition workforce needs to be involved in addressing the cyber threat? The short answer is: Just about everyone! Cybersecurity continues to remain a team sport. The threat is growing, dynamic and evolving. It is a difficult problem. Acquisition workforce members need to be both aware and proactive from a cybersecurity perspective. If this occurs, the DoD can win this fight. If everyone takes the attitude that it’s someone else’s issue, the DoD will remain at risk. In the past, the focus of cybersecurity (formerly called information assurance) was security of the network and was primarily a concern for Information Technology career field personnel. This is clearly no longer the case. Cybersecurity is now a concern for all career fields and applies to all DoD systems that process DoD information.

To be successful in this effort, the DoD needs the energy, critical thinking and focus of the entire acquisition community, user community and our industry partners right now. This will take time to get right, but it can and must be done. In the end, it will come down to hard work, motivated acquisition professionals in all career fields treating cybersecurity as a design consideration, and informed leaders who make cybersecurity of DoD acquisition programs a priority.

The authors can be contacted at steve.mills@dau.mil and steve.monks@dau.mil.

Losing **Something** In Translation

Turning Requirements Into Specifications

Charles M. Court, Ph.D.

Perhaps the reader remembers the comedy routine in which a performer orates a lyrical, emotive passage in a deep, inspiring voice—except the quotation is in some unintelligible language. Another performer asks, “What does that mean in English?” The translation is something like, “The snake fell out of the tree, onto the baby and ate him.” As audience members gasp in revulsion, they hear the punchline, “It loses something in translation.”

Requirements managers, program managers and warfighters also gasp in revulsion after engineering teams translate requirements into specifications. Sometimes something gets lost. More often, requirements turn into extensive and expensive specifications. The program managers decry “requirements creep” while the requirements

Court is the Requirements Center Director at the Defense Acquisition University's Defense Systems Management College at Fort Belvoir in Virginia. He is a former Wild Weasel Electronic Warfare Officer, a test manager, a program manager, and an Air Force laboratory supervisor. His doctorate from Walden University specialized in Organizational Behavior.



tion team member can read those requirements and immediately agree on how to meet them. Unfortunately, this is not an ideal world. Unfortunately, the reality of what is possible turns clear goals into complicated systems, subsystems and components. This amounts to an “explosion” of technical requirements and specifications after the initial validation of the operational requirements.

Remember how everything starts with analysis. The Capabilities-Based Assessment starts with directives, policy changes and reports from the field to determine what the warfighter must be able to do. The assessment prioritizes the support and materiel for the warfighter, and the requirements managers write the appropriate documents. If nothing else fills a capability gap, requirements managers must make a case to develop something new.

These technical requirements and derived technical specifications provide the details necessary to develop design, manufacture, test and support the hardware behind a military capability. For example, a validated operational requirement may lead to developing a new tracked vehicle. Top-level operational requirements may lead to a technical requirement for treads necessary to transit areas with low traction. Since U.S. forces have a worldwide mission, the operational requirement may lead to derived technical specifications such as



A Partial List of Different Types of Requirements

Affordability	Funding	Reporting
Allocated	Information	Resource
Analysis	Information	service (with a
Bureaucratic	Systems	small "s")
Capability	Logistics	Stakeholder
Compliance	Milestone	Stated
Contractual	Mission	Statutory
Cost	Operational	Strategic
Customer	Performance	Support
Data	Phase	Sustainment
Derived	Physical	System
Design	Program	System-specific
Documentation	Programmatic	Technical
Functional	Regulatory	Testing

What Is a "Requirement?"

Part of the confusion comes from disagreement over the very word "requirement." Too often, a reader must use the context to determine whether a document is about capability requirements, strategic requirements, technical requirements or any of the other requirements in the partial list below.

For the sake of clarity, the two documents behind the Joint Capabilities Integration and Development System (JCIDS)—the *Chairman, Joint Chief of Staff Instruction (CJCSI) 3170.01* and the *JCIDS Manual*—do not use the single word "requirement" but consistently define and apply the term "capability requirement." Both sources define capability requirement as "A capability which is required to meet an organization's roles, functions, and missions in current or future operations."

All Requirements Are Created Equal—Then It Gets Complicated

Once the requirements managers document the capability requirements, the translation to specifications begins. Part of the loss in translation comes from the need for technical specificity and clarity. For example, the *International Council on Systems Engineering (INCOSE) Handbook* has a more rigorous definition of a requirement: "A statement that identifies a system, product, or process characteristic or constraint, which is unambiguous, clear, unique, consistent, stand-alone (not grouped), and verifiable, and is deemed necessary to stakeholder acceptability."

The confusion over terminology is exacerbated further by confusing requirements with specifications. Requirements

managers at the top of the pyramid apply their operational experience to draft the "high-level" operational requirements. Systems engineers turn those operational requirements into technical requirements for the subsystems and into specifications for each component. This means both requirements managers and systems engineers write statements called requirements. To many program managers and program offices, anything called a requirement becomes non-negotiable. Failing to meet any requirement is unacceptable. The program office and the developing contractor will do their best to meet any and every requirement, whatever its source.

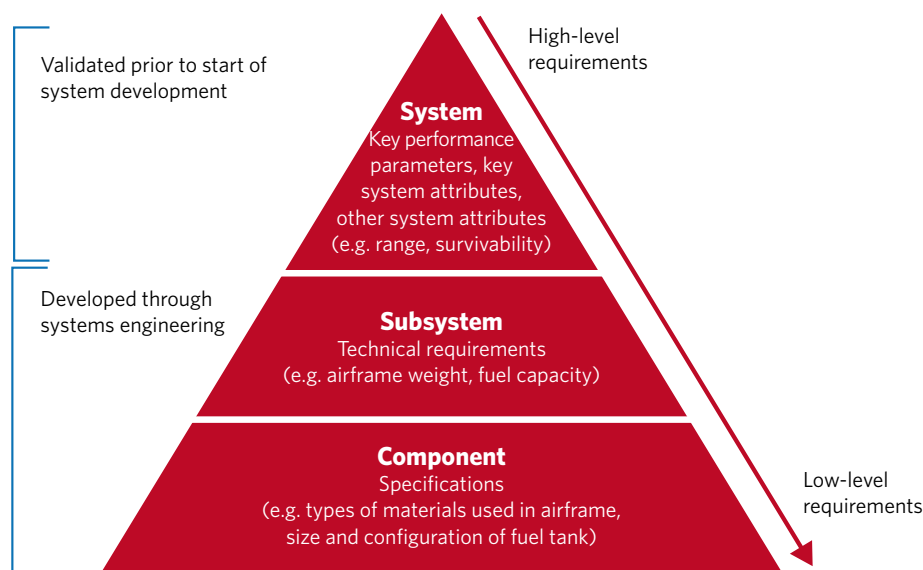
One saving advantage is the flexibility the Pentagon leadership had built into JCIDS. First, not every operational requirement has the very highest priority. Once the requirements managers develop the operational

tread width calculated on maximum allowable ground pressure for the worst-case operational terrain.

The process of progressing from high-level operational requirements to technical requirements to component specifications looks something like the illustration from a recent Government Accountability Office (GAO) report (Figure 1).

While supporting the warfighter is of overriding importance, meeting the warfighters' needs becomes complicated and expensive in the translation from system to subsystem to component.

Figure 1. How Operational Requirements Become Component Specifications



Source: Government Accountability Office report, *Defense Acquisition Process—analysis of DoD policy and guidance*/GAO 15-469, June 2015.

requirements for a proposed new system, the managers triage those requirements into three priority levels: Key Performance Parameters (KPPs), Key System Attributes (KSAs) and Additional Performance Attributes (APAs). See Figure 2.

The *JCIDS Manual* defines KPPs as: “Performance attributes of a system considered critical or essential to the development of an effective military capability.” Originally, failure to meet a KPP meant that the Department of Defense (DoD) would cancel the program. Declaring a requirement a KPP was tantamount to saying, “If the new system cannot meet this requirement, we don’t want it at all. We will keep what we have now.” This standard has softened to the point that a failure to meet a validated KPP will trigger a review. This validation authority review may lead to program cancellation, but it may also result in the modification of production increments or in an updated KPP value.

The authority that validated the KPP can modify the KPP. For an Acquisition Category I program, the validation authority is the Joint Requirements Oversight Council (JROC) chaired by the Vice Chairman of the Joint Chiefs of Staff. Managers approach the JROC with great trepidation, but Pentagon leadership strives to show the flexibility that requirements managers and program managers need in order to make necessary modifications and trade-offs.

KSAs are one step below KPPs. The *JCIDS Manual* defines KSAs as, “Performance attributes of a system considered important to achieving a balanced solution/approach to a system, but not critical enough to be designated a KPP.” A sponsor at the level of a four-star officer or an Agency Director can modify a KSA.

The APAs offer more opportunity to make trade-offs as the requirements managers and the program offices apply

lessons learned during system development. APAs are performance attributes of a system that are not important enough to be considered KPPs or KSAs but still appropriate for inclusion in requirements documents such as the Capability Development Document (CDD) and the Capability Production Document (CPD).

One remaining area of confusion involves the difference between threshold and objective values. The threshold value is the minimum value that will have operational utility. In other words, a threshold may be the minimum range or payload that the warfighter will find useful. The objective is either the maximum parameter or the maximum feasible parameter that offers operational utility. Anything beyond the objective is beyond what the user will need. Capability beyond the objective amounts to the “gold plating” everyone wants to avoid.

Recurring Inconsistencies

Remember that KPPs, KSAs and APAs all represent capability requirements. When the systems engineers develop technical requirements, the sheer number of those technical requirements can become overwhelming.

High-level requirements—capability requirements derived from analysis and developed by requirements managers with operational experience—lead to many low-level requirements such as technical requirements and specifications. Congress decries this “requirements explosion.” Program managers scream “requirements creep.” All the warfighter really cares about are the high-level requirements, the capability requirements. At the operational level—when guns are firing and bombs are exploding or the rocks are getting too close—the warfighter does not have time to care about the technical requirements and specifications. The overriding goals remain defeating the enemy and protecting our forces, friendly forces and noncombatants.

The challenge becomes knowing when to make essential, effective trade-offs. Here is where program management and requirements management combine into a contact sport; bad things happen when each specialization works in isolation. The requirements manager—representing the warfighter—must work with the systems engineers within the program office. Managers and engineers combine their knowledge and experience to develop appropriate tradeoffs. At the inception and throughout the acquisition phases, all parties need coherent answers to critical questions such as:

- What capability does the warfighter really need?
- How do we know that stated need is valid?
- What are the costs and associated risks associated with meeting a threshold or an objective?
- Can we deal with the associated costs and risks of missing a threshold?
- What is the nature of the associated costs?
—Are we talking about money? Delay? Reliability?

Figure 2. The Requirements Hierarchy



- Does missing a threshold really degrade the military capability?
- What are the payoffs of going beyond the threshold and achieving the objective?
—What are the risks involved in going beyond the threshold?
- What do the ensuing risks mean to the warfighter?
- Who needs to validate the trade-offs?

As a development program progresses from analysis to production, many people have opportunities to apply the lessons learned from the Technology Maturation and Risk Reduction phase and the Engineering and Manufacturing Development phase. These lessons learned, for example, may show requirements managers new ways to apply new systems. These lessons also may help the systems engineers and the other technical experts understand what will and will not work in operational environments. Insight into the concepts of operations can guide trade-offs that make the difference between a good system and a transformational system—a system guaranteeing that our warfighters prevail.

The Clash of Cultures

The DoD has excellent reasons to combine three different management systems into what the Defense Acquisition University calls “Big A Acquisition.” JCIDS represents the warfighter and develops the capability requirements. The Defense Acquisition System turns those requirements into specifications and strives to meet those specifications. Planning, Programming, Budgeting, and Execution lines up the resources, including funding. These three management systems operate with different schedules, priorities and urgencies. Successful programs need experienced and talented management to keep the three systems working together.

While the warfighter first cares about accomplishing the mission, the engineers and the rest of the acquisition community focus on how to accomplish the mission. One cultural clash results from different group definitions of success. Success to the acquisition community does not necessarily mean success to the warfighter. Meeting every specification does not guarantee operational utility. It is difficult to achieve agreement between the different viewpoints. Here is where requirements managers and program managers need to be aware of the potential breakdowns that can arise from the clash between their two cultures. Both types of managers should anticipate additional confusion as they depend on the technical and professional expertise of diverse professions such as the system engineers, test managers and logisticians.

Solutions From Leadership, Management and Communications

Everyone can agree that great leadership and great management demand great communications. We cannot afford to waste time and money on unnecessary requirements and specifications. All of the specialists and managers live with the same funding limitations, scheduling priorities, state of

technology and laws of physics. Everyone needs to recognize the differences between capability requirements and technical specifications. In the ideal situation, everyone agrees on which trade-offs would most reasonably help accomplish the mission on time and within the budget.

It isn’t easy to establish and maintain communications across the different groups. Every team member wants to do a great job for the warfighter. But the unintelligible language of a different professional culture and the confusion from different points of view can derail the best intentions. Requirements managers have a responsibility to communicate why they need the requirements that they write and validate. Great systems engineering shows a clear trail from the high-level capability requirement to the technical specifications. Everyone needs to avoid the confusing practice of calling technical specifications “low-level requirements.”

Great communication takes time, effort and understanding. To that end, we all are translators who cannot afford to lose important requirements and distinctions in translation. We all need insight into the DoD processes, into the different management systems within “Big A” Acquisition, and into the different disciplines that are needed to develop our programs.

Now, is that a carnivorous snake in the tree or a colorful ribbon floating in the breeze? Is the baby being eaten alive or is he simply giggling in delight over a harmless new toy? The differences are significant. In the same vein, we must work together to make accurate but necessary translations as we go from capability requirements to technical specifications and then to operational systems. &

The author can be contacted at charles.court@dau.mil.

MDAP/MAIS Program Manager Changes

With the assistance of the Office of the Secretary of Defense, *Defense AT&L* magazine publishes the names of incoming and outgoing program managers for major defense acquisition programs (MDAPs) and major automated information system (MAIS) programs. This announcement lists the only such change of leadership for both civilian and military program managers reported for the months of January and February 2016.

Air Force

Col John Newberry relieved **Col Christopher Coombs** as program manager for the KC-46 Systems program on Feb. 8, 2016.

Another Source of Tools and Resources for Your Programs

The DAU and PMI Agreement— a Commitment to Excellence

The Defense Acquisition University and the Project Management Institute (PMI)—a nonprofit professional membership association—established a Memorandum of Understanding as a mutual commitment to excellence in learning, research and strategic collaboration. This collaboration aims at providing the best training built upon the expertise of the private civilian sector and also the general public and government sectors. As part of the collaboration, PMI makes available for practitioners a wealth of information online. Below is a list of the content and their links for portfolio, program and project managers:

Business and Government: Regardless of your industry or mission, project management is the value driver that helps your organization get the most out of its performance. Explore these organizationally related tools at <http://www.pmi.org/Business-Solutions.aspx>.

Academic Research: PMI Academic Research works to advance the profession through research and education programs, informing the practice of project management and the real-world application of research results. Free Registration at <https://pmiteach.org/>.

Pulse of the Profession and In-Depth Reports: The Pulse is PMI's annual global survey of project, program and portfolio managers that charts the major trends in project management. Throughout the year, PMI takes a closer look at critical topics originating in the Pulse reports in the In-Depth Report series. See <http://www.pmi.org/learning/pulse.aspx>.

Thought Leadership Series: Topics include portfolio management, talent management, program management offices and various others. The reports, which provide excellent executive-level insights, were developed in collaboration with consultants such as the Economist Intelligence Unit, The Boston Consulting Group, and Deloitte. See <http://www.pmi.org/learning/thought-leadership.aspx>.

Organizational Methodology: As an example of reports available, these are a collection about organizational methodology. Organizations that use a methodology can focus more on the important tasks of leading, innovating and delivering products and services, while improving efficiency and performance. See <http://www.pmi.org/learning/Organizational-Project-Management-Methodology.aspx>.


Case Studies: Our collected case studies highlight how organizations are implementing project management practices and using PMI products, programs or services to fulfill business initiatives and overcome challenges: <http://www.pmi.org/Business-Solutions/OPM3-Case-Study-Library.aspx>.

Knowledge Shelf: This is a growing resource of articles contributed by project managers to advance the body of knowledge. It's a great place to expand your understanding of different aspects of project management. See <http://www.projectmanagement.com/searchResult.cfm?keywordID=1369>.

The following media require membership, a premium or purchase, depending on the items.

Standards: PMI global standards provide guidelines, rules and characteristics for project, program and portfolio management. These standards are widely accepted and, when consistently applied, they help you, your global peers and your organization achieve professional excellence. Member download, otherwise purchase, at <http://www.pmi.org/PMBOK-Guide-and-Standards.aspx>.

Tools and Templates: Templates, deliverables, checklists, and presentations available at [projectmanagement.com](http://www.pmi.org/learning/tools-and-templates.aspx): <http://www.pmi.org/learning/tools-and-templates.aspx>. Here many downloads are free and many others require a premium on projectmanagement.com or PMI membership.

PMI is the world's leading not-for-profit professional membership association for the project, program and portfolio management profession. Founded in 1969, PMI delivers value for more than 2.9 million professionals working in nearly every country in the world through global advocacy, collaboration, education and research. 

CONTR

Why Should We Care About **Outsourcing**?

Brian Schultz

**Outsourcing:
Practice used by
companies to reduce
costs by transferring
portions of work to
outside suppliers
rather than completing
it internally.
(Investopedia)**

Outsourcing is a common practice in several industries in today's global business environment. The concept is fairly simple. A company often will buy or outsource products and services (as depicted in Figure 1) from other companies if doing so is in its best corporate interests. In the defense industry, outsourced work has trended upward and can be as much as 70 percent or even 80 percent of the total work content.

Companies typically address several factors in assessing an outsourcing decision, sometimes also referred to as a make-versus-buy decision. First and foremost, outsourcing (buying) can improve the financial bottom-line returns. Not having to carry the capital equipment, facilities and labor needed to make a product frees up invested capital for other uses in the company. Outsourcing reduces inventory and gross

Schultz is a professor of Program Management for the Capital Northeast Region of the Defense Acquisition University at Fort Belvoir, Virginia.



investment requirements, both of which improve the balance sheet and Return on Invested Capital (ROIC). In some contracts where data are available, less than 5 percent of all the touch labor on the program actually was being performed by the prime contractor. The rest of this labor comes from the prime's tiered supplier network that is outsourced at several layers or tiers of other companies.

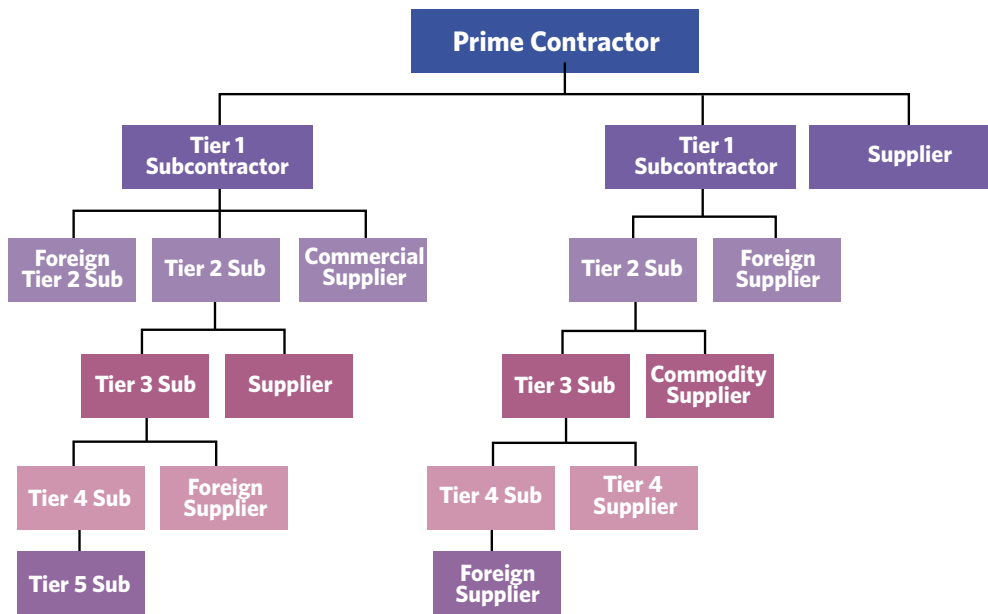
Companies also outsource work for nonfinancial reasons, including focusing core competencies in other business areas, developing strategic partnerships, ensuring alternate sources, and enabling greater innovation. In today's fast-changing business landscape, companies can quickly change their business models by leveraging the capabilities of others and finding new ways to increase value to their customers and shareholders. The rapid response and flexibility aspects of outsourcing can make it an attractive and efficient option as businesses strive to stay competitive.

The concept of a tiered network of suppliers is important for industry and for Department of Defense (DoD) program managers (PMs). See Figure 1. While we can expect visibility into the prime and subcontractor work efforts, this visibility can rapidly diminish as work is outsourced from one tier to the next lower one. Understanding this flow-down of money and work efforts can shed light on significant risks related to poor quality, late deliveries, cost overruns and technical performance.

The following discussion addresses some examples of outsourcing considerations in overall acquisition strategy planning and contract execution, including some specific techniques PMs can employ to address supplier risks:

Market Research: Robust market research is a great way to get knowledge of the potential subcontractors and suppliers. Depending on the mission area, products and services can change quickly in today's global markets, so it's

Figure 1. Tiered Network of Contract Suppliers



practices, PMs can consider carefully how to manage the supplier risks and get and maintain the needed visibility. The industrial base considerations section of the acquisition strategy should include some consideration of how the strategy will address supplier risks in addition to other industrial base concerns. For example, contract clauses like the previously mentioned consent to subcontract could be included in the Request for Proposal (RFP).

For sole source contracts, PMs should consider use of a Make or Buy Plan as part of the contractor proposal. This plan provides the government the right to review and agree on the contractor's make-or-

a good practice to maintain an ongoing market surveillance effort. Asking potential offerors to identify their potential major subcontracts, typical supplier base, and their assessment of supplier risks can yield lots of useful data. DoD Instruction (DoDI) 5000.02 provides the expectation that industrial capabilities will be addressed as part of the acquisition strategy and that market research will help provide the data on supplier as well as prime contractor capabilities necessary for this part of the strategy.

Ensuring a good understanding of how the potential prime contractor(s) plans to outsource work content was a big lesson from my PM experience. This knowledge often requires market research and may not be apparent unless there is some examination of the company's practices on similar efforts. For example, if I had known in advance that my prime contractor planned to outsource a risky subsystem sensor to a supplier with questionable past performance in this mission area, I would have developed an acquisition strategy to address this risk. That strategy would have incorporated some specific contract requirements to ensure adequate insight into this work, including potential use of a consent-to-subcontract clause.

The consent-to-subcontract clause (Federal Acquisition Regulation [FAR] subpart 44.2) can be used for subcontracts of critical and risky subsystems as well as for reviewing the contractor's purchasing system. The clause does not relieve the prime of any performance responsibility associated with the approved subcontractor but enables greater DoD insight and oversight of critical sourcing decisions.

Acquisition Strategy Development: With greater insight into contractor supplier management and outsourcing

buy program to ensure the negotiation of reasonable contract prices and to provide additional insight into the planned supplier scope. This plan also provides insight into the amount and scope of competition at the subcontract level. Other tools that should be considered include a subcontractor management plan (deliverable after contract award), inspections clauses, and use of earned value management flow-down to critical suppliers.

Contractual incentives could stress the importance of an effective subcontract and supplier management program. Appropriate incentives also should be part of the prime's plan to incentivize key subcontractors and suppliers. Finally, if this area poses significant risks, the source selection evaluation criteria should include it as part of the evaluation process.

Integrated Prime and Supplier Management Reviews: The prime and key suppliers should participate in management reviews of the program status, issues and risks. One of my previous weapon system program offices routinely included the three major subsystem subcontractors at important execution and planning meetings. This practice served the team very well and helped establish good communications and teamwork.

Dealing with supplier issues can be frustrating for the DoD PM since he or she must rely on the prime to resolve the issues. Several years ago as a DoD PM, I conducted a joint prime contractor and subcontractor review of program status on an important subsystem development effort. This effort was plagued with several technical issues and schedule delays. At the review, the prime contractor PM was very critical of the subcontractor's performance and seemed to be satisfied that

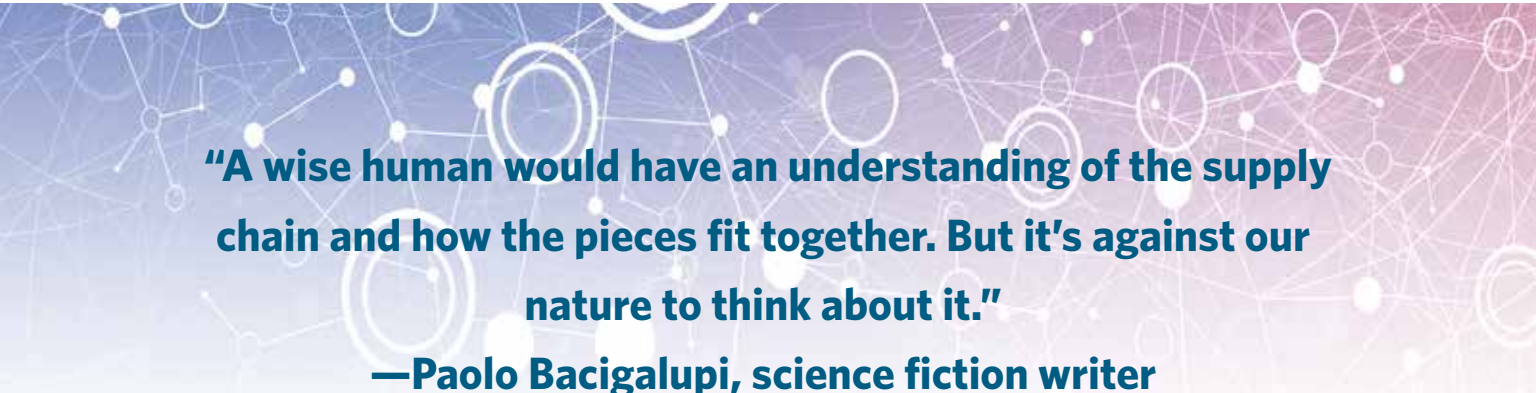
his negative critique of the development status update and plan ahead was all he needed to do.

That dynamic changed when I asked him what his company was going to do to resolve all these issues. I also made it clear that this particular supplier management area would be a contract performance assessment report (CPAR) item. Now the focus shifted to the prime contractor, who was ultimately responsible, instead of focusing on the subcontractor. This set the tone for subsequent actions, and the prime contractor PM now clearly understood how the prime's performance in managing this subcontract effort would be in the spotlight. Not long after, the prime contractor sent some of its technical experts in this area to the subcontractor facility to provide more proactive assistance and help get the program back on track.

assist in this area and provide needed contractor purchasing system reviews. Finally, some DCMA offices have industrial and supply chain experts who can help the PM work with the prime contractor to oversee subcontractor quality requirements compliance.

Trusted Suppliers and Processes for Critical Components:

Cybersecurity and other malicious threats must be addressed as part of the supplier management effort. DoD as an enterprise is dealing with significant challenges associated with the globalization of the defense industry, including access to foreign technology and trusted microelectronics. For example, China recently announced new regulations requiring that companies selling computer equipment to Chinese banks turn over software source code, submit to invasive audits and build back doors into hardware and software. More recently,



"A wise human would have an understanding of the supply chain and how the pieces fit together. But it's against our nature to think about it."

—Paolo Bacigalupi, science fiction writer

DCMA Post-Award Surveillance: PMs should be aware of the services and assistance that the Defense Contract Management Agency (DCMA) can provide, including post-award surveillance. Working closely with DCMA to assess supplier risks and performing surveillance on appropriate work efforts can provide critical visibility into high-value and high-risk activities, especially with limited program office staff. The dialog with DCMA and early planning should help ensure that resources can be allocated effectively.

What suppliers will warrant surveillance? Given the large number of subcontractors and suppliers at various tiers below the subs, it's important to identify early which of these will require some level of visibility into their work progress. Developing a supply chain map that identifies suppliers at each tier can be useful in following the flow-down of money and work content.

Depending on the amount of proposed outsourcing and the associated risk, PMs may need to include specific RFP requirements that ensure the appropriate level of insight and oversight into this network of suppliers. The DCMA can

the issue of a back door to get into the Apple iPhone, bypassing encryption to access user data, has generated a big debate about whether potential hackers and adversaries also could leverage this back door.

Addressing the malicious threat risk should be part of a robust program protection and system security engineering plan. The PM's system engineer should have access to the latest tools, including criticality, vulnerability and threat assessment methods, sample contract language, etc., to assist in working with the prime contractor. While some of these techniques are relatively new, the potential impacts are significant enough to warrant careful consideration.

The risk of counterfeit parts in the supply chain also should be addressed. The current guidance of the Defense Federal Acquisition Regulation Supplement requires a risk-based counterfeit electronic part detection and avoidance system. But a proposed new rule adds significant sourcing restrictions in addition to the detection and avoidance approach. This issue is growing in the level both of interest and practices to deal with the threat. The significance of the threat can be seen in a new

DoD rule that enables the DoD to exclude companies assessed as supply chain risks involving information technology products and services related to National Security Systems (NSS).

Supplier Benchmarking and Screening: Supplier benchmarking and screening relates to company past performance and the capabilities of various companies under consideration. At the prime contractor level, DoD has instituted a superior supplier incentive program, ranking the top 25 companies in each service based on their performance as assessed in CPARs.


Companies can and should institute a similar approach with their suppliers, providing incentives for the suppliers to become well qualified and recognized as top performers in their business areas. The potential for a contractor purchasing system review also can be discussed with the DCMA, based on past performance of the contractor, subcontracting volume, complexity of subcontracts and dollar value of the subcontracts.

I believe that, if some of the contractors I worked with had a more robust supplier benchmarking and supplier qualification screening process, many of the subcontractor performance issues would not have occurred because a better-qualified

company would have been selected. There are many industry initiatives in this area, and companies should be willing and able to discuss their process for selecting and rewarding qualified suppliers.

Final Thoughts

The amount and complexity of outsourced work in DoD programs has grown over the last few decades and has changed the dynamics of program planning, execution and oversight for many PMs. This new business model can present significant risks, thus often necessitating a more proactive risk management and oversight approach. Use of appropriate techniques in market research, acquisition strategy development and RFP development, program governance, and risk and opportunity management processes will help PMs manage the risks.

On the opportunity side, let's not forget that outsourcing and supplier management can help reduce costs and increase value to industry and the DoD. It also allows for new and innovative suppliers to offer technological solutions that otherwise may have not been considered. 

The author can be contacted at brian.schultz@dau.mil.

Where Can You Get the Latest on the Better Buying Power Initiatives?

- BBP Gateway (<http://bbp.dau.mil/>) is your source for the latest information, guidance and directives on Better Buying Power in defense acquisition
- BBP Public Site (<https://acc.dau.mil/bbp>) is your forum to share BBP knowledge and experience



DEPARTMENT OF DEFENSE

Better Buying Power
Acquisition, Technology, and Logistics



2015

David Packard Excellence in Acquisition Award



The David Packard Excellence in Acquisition Award was established to recognize organizations, groups and teams that have demonstrated exemplary innovation using best acquisition practices that achieve acquisition excellence in the Department of Defense (DoD). It is the DoD's highest acquisition team award and was first awarded in 1997 in honor of David Packard, a former Deputy Secretary of Defense during the Nixon administration. Mr. Packard also was the co-founder and chairman of the Hewlett-Packard Co. and chairman of the President's Blue Ribbon Commission on Defense Management chartered by Ronald Reagan in 1985. He founded the Defense Systems Management College in 1971 and was a strong advocate of excellence in the defense acquisition practices.

The David Packard Excellence in Acquisition Award recognizes teams that have demonstrated superior program management and accomplishment in the successful execution of one or more of the Better Buying Power efficiencies and associated initiatives. The principles of acquisition excellence and exemplary innovation using the best acquisition practices remain fundamental to the Packard Award.

Three teams received David Packard Excellence in Acquisition awards, presented at a Feb. 19, 2016, Pentagon ceremony hosted by the Honorable Ashton Carter, Secretary of Defense.

Should Cost and Innovation Award

The Should Cost and Innovation Award, sponsored by the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]), recognizes organizations, groups or teams that have displayed outstanding commitment, innovation and results from should cost management. The concept of should cost management is fundamental to proactive cost control throughout the acquisition life cycle. This initiative requires the active management of cost, starting with the

deep understanding of cost structures, followed by identifying specific goals for cost reduction (should cost goals), and the efforts to achieve those cost reductions. Should cost is a core and enduring Better Buying Power initiative, and most programs and contracted activities in DoD now have should cost targets and are managing to them. Two teams received the DoD's Should-Cost and Innovation Award on Feb. 19.

2015 David Packard Award Winners

"Our 2015 Packard Award recipients have done some pretty amazing things," Defense Secretary Ashton Carter said, and described the teams' achievements.

- The Space-Based Infrared System Geostationary Earth Orbit 5/6 team saved more than \$1 billion in purchasing and modernizing satellites that are critical to U.S. protection from strategic and theater ballistic missile threats.

The Space-Based Infrared System Geostationary Earth Orbit 5/6 team:

From the left, Darlene Costello, Acting Principal Deputy, Assistant Secretary of the Air Force (Acquisition); the Honorable Frank Kendall (USD[AT&L]); Lt Col Christian G. Elenbaum; Col Fred G. Kennedy, III; Ms. Doreen Grosvirt-Dramen; Maj Peter M. Volpe; Mr. Ibrahim K. Awwad; Mr. Alexander Walter



The Ground/Air Task Oriented Radar team:

From the left, Mr. William Taylor, Program Executive Officer (Land Systems); the Honorable Sean Stackley, Assistant Secretary of the Navy (Research, Development and Acquisition); Mr. Kendall; Mr. John F. Karlovich; CWO5 William A. Kelly, Jr.; Ms. Christine M. Kuney; Ms. Maya R. Jackson; Mr. James A. McGregor



The Joint Program Office's Joint Light Tactical Vehicles team: From the left, Mr. Stackley; Mr. Taylor; the Honorable Katharina McFarland, Acting Assistant Secretary of the Army (Acquisition, Logistics and Technology); Mr. Kendall; Col Shane Fullmer; Mr. Scott Davis, Program Executive Officer (Combat Support and Combat Service Support); Mr. Andrew Rodgers; MAJ Jonathan Bodenhamer; Mr. Scott Doudna

2015 Should Cost and Innovation Award Winners

Mr. Carter also recognized the two recipients of the Should-Cost and Innovation Award.

"Should cost is a term I coined with [Under Secretary of Defense for Acquisition, Technology, and Logistics Frank [Kendall]] ... as a way of highlighting the importance for all program managers—on the government and industry teams—to understand thoroughly every single item and ... to make sure they know what each part should cost," the secretary explained.

By doing so, he added, the two 2015 Should-Cost Award recipients have saved a tremendous amount of money for the taxpayer.

The Air Force Materiel Command's Armament Directorate saved \$694 million while equipping U.S. warfighters with war-winning airpower capabilities, Mr. Carter said.

"They've fostered a culture for a 1,800-person organization in which an innovative idea from one program can now be immediately shared and replicated across 83 other programs," he added.

The E-2/C-2 Airborne Tactical Data System Program Office built a software platform in its spare time to manage should-cost initiatives for products that extend the Navy's eyes, ears and logistics capabilities.



The Air Force Materiel Command's Armament Directorate: From the left, Ms. Costello; Mr. Kendall; Brig Gen Shaun Morris; Ms. Angela Hager; Mr. Jonathan Pinto; Mr. Joe Allison; Mr. Darin Huler



The E-2/C-2 Airborne Tactical Data System Program Office: From the left, Mr. Stackley; Mr. Chris Frayser; Mr. Kendall; CDR Ken Grzymalski; Mr. Stephen Munley; Mr. Clint Osborne

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Defense AT&L

Writers' Guidelines in Brief

Purpose

Defense AT&L is a bimonthly magazine published by DAU Press, Defense Acquisition University, for senior military personnel, civilians, defense contractors and defense industry professionals in program management and the acquisition, technology and logistics workforce.

Submission Procedures

Submit articles by e-mail to datl@dau.mil. Submissions must include each author's name, mailing address, office phone number, e-mail address, and brief biographical statement. Each must also be accompanied by a copyright release. For each article submitted, please include three to four keywords that can be used to facilitate Web and data base searches.

Receipt of your submission will be acknowledged in 5 working days. You will be notified of our publication decision in 2 to 3 weeks. All decisions are final.

Deadlines

Note: If the magazine fills up before the author deadline, submissions are considered for the following issue.

Issue	Author Deadline
January-February	1 October
March-April	1 December
May-June	1 February
July-August	1 April
September-October	1 June
November-December	1 August

Audience

Defense AT&L readers are mainly acquisition professionals serving in career positions covered by the Defense Acquisition Workforce Improvement Act (DAWIA) or industry equivalent.

Style

Defense AT&L prints feature stories focusing on real people and events. The magazine seeks articles that reflect author experiences in and thoughts about acquisition rather than pages of researched information. Articles should discuss the individual's experience with problems and solutions in acquisition, contracting, logistics, or program management, or with emerging trends.

The magazine does not print academic papers; fact sheets; technical papers; white papers; or articles with footnotes, endnotes, or references. Manuscripts meeting any of those criteria are more suitable for DAU's journal, *Defense Acquisition Research Journal (ARJ)*.

Defense AT&L does not reprint from other publications. Please do not submit manuscripts that have appeared elsewhere. Defense AT&L does not publish endorsements of products for sale.

Length

Articles should be 1,500-2,500 words.

Format

Send submissions via e-mail as Microsoft Word attachments.

Graphics

Do not embed photographs or charts in the manuscript. Digital files of photos or graphics should be sent as e-mail attachments. **Each figure or chart must be saved as a separate file in the original software format in which it was created.**

TIF or JPEG files must have a resolution of 300 pixels per inch; enhanced resolutions are not acceptable; and images downloaded from the Web are not of adequate quality for reproduction. Detailed tables and charts are not accepted for publication because they will be illegible when reduced to fit at most one-third of a magazine page.

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